

Cybernet

System 700

CT-700S

Service Manual

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Specifications

Power consumption.	20 Watt.	Carrier leak (19 kHz).	65 dB.
Power supply.	220V 50 Hz AC.	Output voltage.	775 mV.
Dimensions.		AM	
Width	420 mm.	Frequency range.	531 to 1,602 kHz.
Height	48 mm.	Sensitivity.	300 microvolt/m.
Depth	430 mm.	Selectivity.	45 dB.
FM		Image rejection.	50 dB at 1 kHz.
Frequency range.	87.5 to 108.0 MHz.	S/N.	50 dB.
Sensitivity.	10.3 dBf (1.8 microvolt IHF '58).	Output voltage.	300 mV.
50 dB quieting sensitivity.			
Mono	16.6 dBf (3.7 microvolt IHF '58).		
Stereo	37.2 dBf (39.2 microvolt IHF '58).		
Total harmonic distortion.			
Mono	0.1% 1 kHz.		
Stereo	0.2% 1 kHz.		
S/N.			
Mono	75 dB.		
Stereo	70 dB.		
Frequency response.	30 to 15,000 Hz +0, -0.5 dB.		
Alternate channel selectivity.	80 dB.		
Capture ratio.	1.2 dB.		
Image rejection ratio.	70 dB.		
IF rejection.	90 dB at 98 MHz.		
Spurious response rejection.	85 dB at 98 MHz.		
AM suppression.	55 dB.		
Separation.			
1 kHz	50 dB.		
10 kHz	39 dB.		

Instruction Information

Features

The Cybernet model CT-700S is a high fidelity stereo tuner designed to be incorporated with other System 700-series components — the integrated stereo amplifier model CA-700 and the stereo cassette deck model CCD-700 — into a complete stereo system. It features the following:

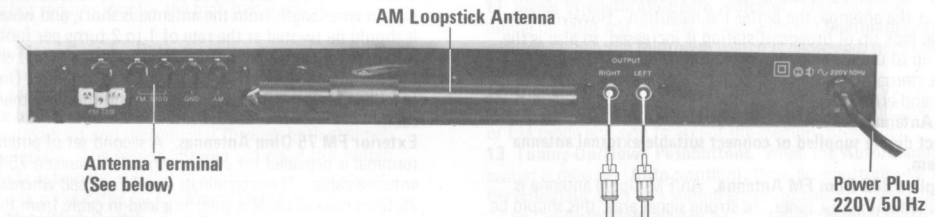
Fluorescent digital AM/FM frequency display/Automatic and manual tuning with digital PLL synthesizer/Memory pushbutton tuning for 7 AM and 7 FM stations/Short-time-hold [STH] feature for temporary station tuning/Switchable indicator array for signal strength or multipath interference indication/Multiplex filter for reduction of residual multiplex pilot noise/Sensitive dual gate MOSFET in the FM front end/High selectivity IF stage with 3 dual-element ceramic filters/Phase-locked-loop [PLL] multiplex stage for stable stereo demodulation/Illuminated pushbuttons.

Installation

Installation of your new tuner is not complicated. However, the following guidances must be followed for satisfactory performance and easy operation of the system.

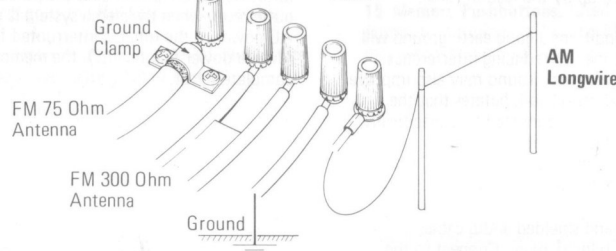
Do not remove the cover — there are no user serviceable parts inside the unit. Refer servicing only to the qualified personnel/The unit must not be exposed to excessive dust, moisture, or direct sources of heat and sunlight/To clean the cover, wipe with soft cloth soaked in a neutral cleaner or a polishing cloth. Do not use benzene or thinner which will damage the cover finish.

Tuner Connections

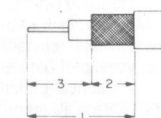


Tuner Output:
Use shielded audio cables.
Connect to amplifier
Tuner input terminals.

Cable Hook-up

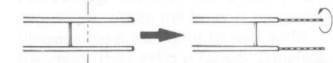


75 Ohm Coaxial Cable



- 1 Remove 30 mm of outer insulation
- 2 Remove all but 20 mm of the shield braid
- 3 Remove inner-insulation leaving 10 mm of the insulation exposed.

300 Ohm Twin-Lead Cable



- 1 Remove 20 mm of insulation and 30 mm of bridge. Strand exposed conductors.

AM Antennas

Select use of attached loopstick or additional long-wire antenna for AM reception.

Ferrite loopstick antenna. The ferrite loopstick antenna is a sensitive pickup element of the AM tuner sections. For maximum station reception, it must be properly positioned away from the rear chassis and other metallic surfaces. The associated connecting cables and AC power cord should be dressed as far away as possible. For optimum performance, the antenna should be positioned for maximum signal strength indicator indication when the unit is tuned to the desired AM station.

External AM antenna. AM antenna terminals are provided for a properly designed long wire AM antenna system. Such antennas are useful when the desired AM stations are at a considerable distance from the tuner. A simple long wire antenna can consist of a length of single conductor, insulated wire of 30 feet (9 meters) or longer, extending from the tuner external AM antenna terminal to the outside of the building. This wire should be positioned away from electrical cables and appliances. As a rule, the longer and higher the antenna, the better the reception. However, as signal pick up of broadcast station is increased, so also is the pickup of undesirable man-made interference. Therefore, the external AM antenna should be evaluated on a trial-and-error basis.

FM Antennas

Select dipole supplied or connect suitable external antenna system.

Supplied 300 Ohm FM Antenna. An FM dipole antenna is supplied with your tuner. In strong signal area, this should be

more than adequate for reception of most FM stations.

Antenna connections are made to the terminal strip marked **FM-300 Ohm** located on the rear panel. The dipole leads are connected to the screws marked **300 Ohm**. The ground screw is not used for the dipole antenna. The dipole should be unfolded to its full T-type size and oriented for optimum performance. Dipole antennas are most sensitive to FM reception when positioned perpendicular to the station.

Exterior FM 300 Ohm Antennas. For fringe (weak signal) areas, or areas where interference to FM reception is high, the use of a log-periodic, or Yagi-type antenna system is recommended. These antennas are directional and high gain in nature, thus tending to reduce most undesired interference due to reflected signals (multipath distortion) and ignition noise. In areas where stations are located in different directions from the point of reception, the antenna must be repositioned for optimum reception of individual stations. For this reason, a good quality rotor is suggested. To minimize the introduction of multipath distortion and ignition interference by the antenna lead-in wires, the use of balanced 300 Ohm [twin lead] cable is recommended. Unshielded twin-lead is suitable where the lead-in wire length from the antenna is short, and when used it should be twisted at the rate of 1 to 2 turns per foot. Long lead-in wires can act as omnidirectional antenna and can cancel out the advantages of directional antenna systems. Unshielded twin-lead is also more susceptible to ignition noise than shielded cable.

Exterior FM 75 Ohm Antennas. A second set of antenna terminal is provided for connecting an unbalanced 75 Ohm antenna cable. These terminals should be used whenever a 75 Ohm coaxial cable is used as a lead-in cable from the

Tuner Power Supply

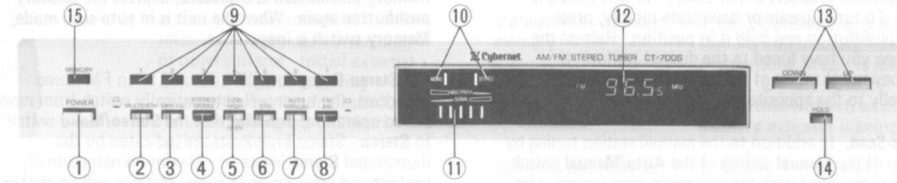
Plug the power cord plug into the wall outlet, supplying **220V 50 Hz AC**. To be sure of protecting the memory information, the power cord plug should be plugged into the outlet even when the stereo system is not in operation. If the AC power to the tuner is interrupted for more than 24 hours (due to power failure, etc.), the memory information will be completely lost.

antenna. The braided outer conductor is connected to ground clamp. Refer to connection diagram for proper cable preparation and hook-up. This type of lead-in offers the same advantages as shielded 300 Ohm cable by minimizing interference picked up by the lead-in cable.

Grounding. Under certain conditions a good earth ground will improve performance of the tuner by reducing interference conducted via the power line. A good ground may also improve the AM performance. Good earth ground dictates that the ground wire be as short as possible, connected to a specifically designed, copper clad steel rod driven into moist earth, or to the cold water supply pipe as it enters the building. Clean oxide from rod or pipe and use suitable ground clamp.

Tuner Output. Use insulated and shielded audio cables terminated with standard pin [cinch] plug. Connect to the input jack on your amplifier or receiver. Observe proper channel connection.

Control Functions



- 1 Power Switch.** Turns the unit on. Lights up when power is on.
- 2 Multipath Switch.** When depressed, turns the signal strength indicator function to multipath interference indication. The minimum multipath interference is indicated by minimum indication of the indicators.
- 3 Multiplex Filter Switch.** When depressed, a special filter circuit is introduced to reduce the high frequency noise in weak FM stereo reception. This filter does not affect frequency response but reduces slightly the high frequency stereo separation.
- 4 Stereo/Mono Switch.** Determines the manner in which a received station will be reproduced through the tuner. When listening to a stereo FM broadcast, depressing this switch will cause the unit to mix the left and right channel signal detected from the broadcast and reproduce it through both channels monophonically. The released **Stereo** setting of this switch will provide automatic stereo FM reception. The mono or stereo mode is indicated by the **Mono/Stereo** indicators.
- 5 Scan/Mute/High Switch.** This switch should normally be set to released position, especially when you wish to listen to very weak FM stations. In the depressed [**High**] position, the mute level during scanning over the band, which a signal must overcome in order to stop the scanning and be heard will be high and only strong signals will be tuned in.
- 6 Short-Time-Hold [STH] Switch.** Used when automatic scanning to resume scanning automatically after tuner has paused on a station for 5 seconds. If you choose to continue listening to that station, depress the **Hold** pushbutton within 5 seconds.
- 7 Auto/Manual Switch.** Determines the manner of **Tuning-Up/Down** pushbuttons usage — automatic-scan or manual

one-by-one tuning.

8 FM/AM Switch. Selects AM or automatic FM stereo reception.

9 Memory Pushbutton. Used to preset 7 AM and 7 FM stations for automatic pushbutton tuning.

10 Mode Indicators. **Mono**, lights up to indicate that the tuner has switched to monophonic FM reception. This indicator is inoperative in AM. **Stereo**, lights up to indicate that the tuner has switched to stereo FM reception.

11 Signal Strength/Multipath Indicator. Normally used for tuning on both AM and FM bands, with the **Multipath** switch released. When the **Multipath** switch is depressed, it can be used as reference to multipath interference.

12 Digital Frequency Display. Shows the frequency of a station to which the unit is tuned directly. Also indicates AM or FM mode and sign to accept the memory presetting.

13 Tuning-Up/Down Pushbuttons. When the **Auto/Manual** switch is released (**Auto** position), these pushbuttons will start the automatic-scan to a station either upscale or downscale. When the **Auto/Manual** switch is depressed (**Manual** position), each time depressing either of these pushbuttons will tune the unit to the next available station assignment precisely 50 kHz away for FM and 9 kHz for AM.

14 Hold Pushbutton. Used when automatic-scan with the **STH** button depressed, to stop the scanning at the desired frequency. If the **Hold** pushbutton is not depressed within 5 seconds after the scan has stopped at a station, the unit will scan automatically to the next station.

15 Memory Pushbuttons. Used for automatic memory pushbutton tuning on AM and FM. Each of 7 pushbuttons may be preset to both AM and FM stations.

Tuner Operation

With the tuner installed properly as outlined, proceed as follows:

FM Tuning. Set the AM/FM switch to FM (pushbutton released). When the tuner is first switched on after plugging the power cord to wall outlet, the lowest FM frequency (87.5 MHz) is tuned. Otherwise, each time you turn on the tuner, the previously selected frequency is selected. Set the Auto/Manual switch to Manual (pushbutton released). Press the Tuning-Up switch to tune upscale and press the Tuning-Down switch to tune downscale. Each time either the pushbutton is depressed, the unit is tuned to the next available FM station assignment precisely 50 kHz away. No fine tuning is necessary. To tune upscale or downscale rapidly, press the

either Tuning switch and hold it in position. Release the switch when you have tuned to the desired station. If you tune beyond the ends of the scale the unit tunes automatically to the opposite end and continues.

AM Tuning. Set the AM/FM switch to AM (pushbutton depressed). When the tuner is first switched on after plugging the power cord to wall outlet, the lowest AM frequency (531 kHz) is tuned. Otherwise, each time you turn on the tuner, the previously selected frequency is selected. Set the Auto/Manual switch to Manual (pushbutton released). Press the Tuning-Up switch to tune upscale and press the Tuning-Down switch to tune downscale. Each time either of the pushbuttons is

depressed, the unit is tuned to the next available AM station assignment precisely 9 kHz away. No fine tuning is necessary. To tune upscale or downscale rapidly, press the either pushbutton and hold it in position. Release the button when you have tuned to the desired station. If you tune beyond the ends of the scale the unit tunes automatically to the opposite end and continues.

Automatic-Scan. In addition to the manual station tuning by making use of the **Manual** setting of the **Auto/Manual** switch, your tuner is equipped with the automatic-scan tuning. Use either manner **a** or **b** depending on the selection of the **STH** switch:

a Set the **STH** switch released (Off). Set the **Auto/Manual** switch to **Auto**. Press the **Tuning-Up** or **-Down** switch. The tuner will scan to a station and continue receiving that station. To rapidly scan-tune from station to station, press the **Tuning-Up** or **-Down** switch for each change.

b Set the **STH** switch depressed (On). Set the **Auto/Manual** switch to **Auto**. Press the **Tuning-Up** or **-Down** switch. The tuner will scan to a station and pause on it for 5 seconds. If you choose to continue listening to that station, press the **Hold** switch (or release the **STH** switch). If the **Hold** switch is not depressed within 5 seconds, the tuner will scan to the next station. Be sure to press the **Hold** switch if you choose to continue listening to that station.

Pushbutton Tuning. Each of 7 pushbuttons may be preset to an AM station and an FM station for automatic pushbutton tuning (7 AM/7 FM; 14 in all). Set the **AM/FM** switch to the desired position. Adjust the **Tuning-Up/Down** switches for the desired station. Press the **Memory** switch. Now the word **Memory** appears on the frequency display area to indicate that the unit is ready to accept the memory, for 5 seconds. Press the pushbutton within 5 seconds to set the station. Now the word **Memory** should disappear from the display. Repeat above steps for each pushbutton. You may later use pushbutton to select the station you wish to hear. **If your**

Trouble Shooting Guide

The following guides are intended as an aid in correcting the problems you may encounter when setting up the stereo system. Although suggested remedies might seem quite elementary, they may be sufficient to make the corrections without returning the unit to your dealer.

Problem	Suggested Remedy
Tuner inoperative, when power switched on.	1 Check for proper power cord insertion to the wall outlet. 2 Blown internal fuse [Be sure to refer checking to qualified personnel].
Indicator lights up but no output from the associated amplifier.	1 Check proper program selection on your amplifier. 2 Check proper tuner output connection to the amplifier.
No output one channel.	1 Refer to above. 2 Interchange audio cables to input jacks to check if the same channel remains inoperative.

failed to press the pushbutton within 5 seconds after the Memory pushbutton is depressed, depress the Memory pushbutton again. When the unit is in auto-scan mode, Memory switch is inoperative.

FM Stereo Reception. When tuned to an FM stereo broadcast, the tuner will automatically switch from mono to stereo operation, provided that the **Stereo/Mono** switch is set to **Stereo**. Stereo broadcasts are indicated by the illuminated **Stereo** indicator. Maximum reduction of background noise on weak stereo stations will be obtained by switching the **Stereo/Mono** switch to **Mono**. This will, of course, put the tuner in a monophonic mode of operation. When listening to weak stations, the **Scan/Mute** switch should be released to prevent the tuner from switching to a mute condition due to reduced signal strength.

FM Multipath Indicator Operation. FM multipath distortion is caused by a broadcast signal reaching the receiving antenna from 2 directions; #1 direct from broadcaster to the tuner, #2 the same signal but received as a reflection from a nearby building or other surfaces. This indicator is operative only when receiving an FM broadcast and the **Multipath** switch is depressed. Set the **Multipath** switch depressed. Set the **AM/FM** switch to **FM**. Adjust the **Tuning-Up/Down** switches for a fairly strong signal. If more than 2 dots of the indicator are lit, considerably strong multipath interference is suspected. In cooperation with other people, rotate the antenna mast to position your antenna for minimum indication on the **Multipath (Signal Strength)** indicator. Proper FM reception free from multipath distortion is indicated by the minimum (ideally none) lighting up on the indicator. To revert to normal signal strength indication, reset the **Multipath** switch.

It is recommended that the multipath interference check is made during no modulation condition of the FM broadcast being received, if really possible.

Weak AM reception.	1 Position loopstick antenna for maximum station pick-up. 2 Locate tuner away from metal surface. If building construction uses aluminum foil faced insulation, metal lath, or steel framing, AM reception will be poor. 3 Install external AM longwire antenna. 4 Locate tuner away from TV set as possible. 5 Locate external AM antenna as far away as possible from interfering source. 6 Install proper earth ground.
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Weak FM reception. 1 Check all external antenna connections. 2 Install a properly designed antenna. 3 Position receiving antenna for maximum signal.

Multipath distortion. Caused by a broadcast signal reaching the FM antenna from two

directions; #1 direct from transmitter [broadcast], #2 the same signal but received as a reflection from a nearby building or other surfaces. Install external antenna. Position receiving antenna for minimum distortion [while observing the multipath indicator on the tuner].

Noisy FM reception.	1 Install external antenna. 2 Use shielded lead-in wire. 3 Install proper earth ground. 4 Rotate antenna for maximum signal. 5 Connect power line filters to
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Circuit Description

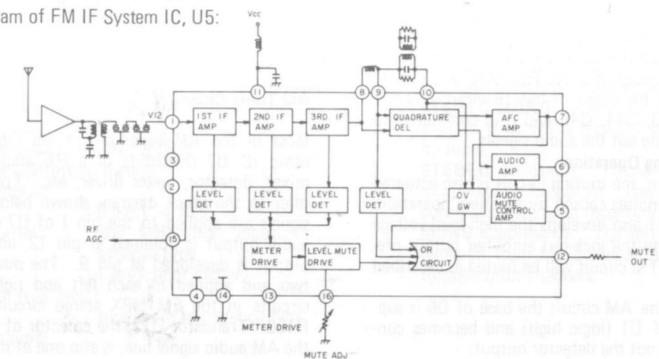
PLL Frequency Synthesizer (Local Oscillator)

The FM local oscillator is comprised of a transistor Q3 and a tuning circuit including an oscillator coil T4 and tuning capacitor D4 (varicap diode). The transistor Q3 is being oscillated at a frequency of a receive frequency + 10.7 MHz, and its output is applied to the prescaler IC U6 through a buffer amplifier Q4. The prescaler U6 counts down the local oscillator signal frequency into a lower frequency (1/20) suitable for phase comparison in the PLL circuitry. Thus obtained low frequency is applied to the pin 3 of PLL IC U3 through a buffer amplifier Q8, and the resultant phase error signal developed at pin 10 is applied to the active LPF filter consisting of transistors Q10 and Q11. Finally the filtered error signal is applied to the oscillator tuning capacitor (varicap diode) D4 to correct (or to generate a new) oscillating frequency.

In case of AM local oscillator operation, the oscillating signal output from the AM oscillator is directly applied to the PLL IC input circuit (pin 3) through a buffer amplifier Q9, and the resultant DC error signal is fed back to the AM oscillator tuning diode D6 also through the LPF filter to correct the oscillating frequency.

The FET transistor Q57 is a lock-out signal amplifier, the gate of which is connected to the pin 10 of U3 where a lock-out signal is being developed while a phase locked condition is not established in the U3. The transistor Q57 amplifies the

Block Diagram of FM IF System IC, U5:



interfering appliances.

Stations will not enter memory.	1 Before attempting to enter stations into memory pushbuttons, press the Memory switch. 2 Press memory pushbutton within 5 seconds as Memory indicator is being on.
Scanning will not stop.	1 Be sure to press Hold switch if you are using STH feature. 2 Check antenna connections.
Scanning will not stop on weak stations.	1 Set Scan/Mute switch released.

signal and the amplified signal is then rectified by diode D9 and D8 to develop DC voltage to be used for muting control, thus reducing undesirable noises during scanning operation (lock-out condition, etc.).

FM Front End and IF

The FM front end consists of two dual gate FETs and a local oscillator and its buffer. The first FET is used as a FM RF amplifier and the second as a Mixer amplifier. Each gate of the mixer is connected to the RF amplifier output and a local signal injection circuit, respectively. The mixed and resultant IF signals are then led to the IF amplifiers consisting of Q5, U4 and U5. The U5 is a multi-function IF system IC including, three stages of limiter/amplifier, FM quadrature detector, meter driver, audio mute signal drive, etc. For further detail of the IC refer to the block diagram shown below.

The detected audio outputs (mono or stereo composite signals) are developed at pin 6 of U5 and applied to the pin 2 of MPX decoder IC. The decoded left and right channel outputs are obtained at pin 6 and 7 of the decoder IC and led to the Tuner Out jacks through low pass filters and one stage of audio amplifier.

MPX Stereo Demodulation

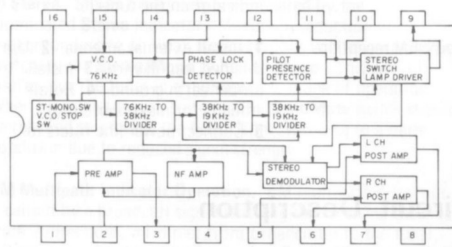
The stereo decoder IC U9 operates as a stereo decoder when its pin 16 is applied by a voltage lower than 1.4V. First inverter output (pin 6 of U8), which develops a high output with increased antenna signal input, is connected to the transistor base of Q18 and makes the Q18 conductive when the FM antenna input signal level is increased, then the pin 16 of U9 is grounded through the emitter-collector of Q18 and STEREO/MONO switch, resulting in stereo mode of operation or a high voltage during mono mode operation, and these voltages are utilized to make the stereo/mono lamps turn on or off.

When FM antenna signals higher than the stereo threshold level is applied to the antenna circuit, the pin 4 of U8 becomes low, and this makes Q13 conductive (this is a common circuit for stereo & mono LEDs).

On the other hand if the U5 operate in stereo mode of operation, the pin 9 develops a low output, then the stereo LED will turn on. However, if the pin 9 develops a high output,

the transistor Q22, the base of which is connected to the pin 9, is turned on, the cathode side of the mono LED is grounded through collector-emitter path of Q22, thus the mono LED is turned on.

Block Diagram of MPX Stereo Decoder IC:



Signal Meter

The FM system IC U5 develops a meter drive voltage at its pin 13 and it is led to the pin 2 of IC U10 (meter amplifier/driver) through the MULTIPASS/METER switch. The U10 amplifies the signal and drives each meter LED connected to its appropriate pin terminals 9 through 13, depending on the signal strength being received.

For AM operation, AM meter drive signal is also connected to the same input pin terminal of No. 2 of IC U10.

Muting Operation

1. FM Muting

The pin 12 of FM IF system IC develops a positive voltage in the event of a low IF input signal level to drive the muting circuit. The positive voltage is first applied to the first inverter pin 7 of IC U8 and the output is obtained at the second inverter pin 4 (since the first and second inverter is connected in serial, the second inverter output is in phase with the first inverter input). The output is then connected to the pin 21 of the controller IC U1. The U1 is designed to develop a logic high voltage at its pin 3 when the pin 21 is applied by a logic high voltage. Since the pin 3 is connected to the base of first muting stage of Q19 through the AUTO/MANUAL switch, the Q19 is turned on in the event of low IF input, and this makes all transistors Q43, Q44, Q45 and Q46 conductive to the ground, thereby muting out the audio signals.

2. Muting During Scanning Operation

During scanning operation, the muting circuit is also actuated to eliminate undesirable noises caused by scanning operation, since the controller IC U1 also develops the high level voltage at its pin 3 in addition to the lock-out amplifier output previously stated. And the FM circuit will be muted as described just above.

On the other hand, in the AM circuit the base of Q6 is supplied from the pin 3 of U1 (logic high) and becomes conductive, thereby shorting out the detector output.

Scan Stop Operation

To secure good scan stop accuracy, the scan stop drive signal must have a narrow, sharp characteristic with its center coincided with that of IF bandwidth. This will be accomplished as follows:

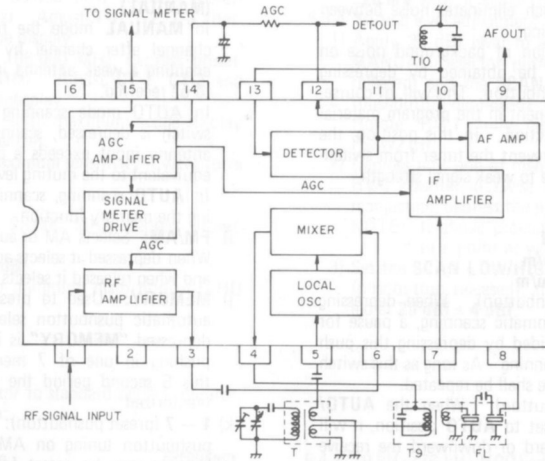
As already described, during scanning operation, pin 3 of U1 develops a high voltage, and this is applied to the base of Q26 and makes it conductive, then the FET Q32 is cut off and the resistor connected across the FET is directly connected to R57 in series. The increased resistance makes final IF bandwidth narrow.

In case of AM operation, a fraction of IF output signal is obtained and further amplified by a narrow band additional IF amplifier consisting of amplifiers provided between pin 9 and 10 and pin 11 & 12 of U8. The amplified output is rectified by diodes D17 and D18 and the output is led to the inverter provided between the pin 14 and 15 of the same IC. A transistor Q12 also operates as an inverter, the collector of which is connected to the last inverter provided between pin 3 and 2. The output developed at the pin 2 will operate in the same way as that of pin 4 in case of FM operation.

AM Tuner Circuit

Most of the AM tuner circuit are integrated in one monolithic IC U7 consisting of a RF amplifier, local oscillator, mixer, detector, meter driver, etc. For detailed information refer to the block diagram shown below. Incoming antenna signals are applied to the pin 1 of U7 and the final detected audio output is obtained at pin 12, and the amplified audio output is developed at pin 9. The pin 9 output is split into two and applied to each left and right channel LPF filter circuits in the FM MPX stereo circuits through R149 and R150. Transistor Q17, the collector of which is connected to the AM audio signal line, is also one of muting circuits.

Block Diagram of AM Tuner IC:



Service Information

Alignment Procedure

1. Measurement condition

- 1) Reference temperature: 25°C
- 2) Reference humidity: 65%

NOTE: Unless otherwise specified, adjustment may be conducted under the room temperature of 5 – 35°C and the room humidity of 45 – 85%.

3) Power supply

- Voltage: AC 220V ± 1%,
Frequency: 50 Hz ± 2%,
THD: less than 2%.

2. Test equipment

Any test equipment to be used in this alignment should have its known accuracy and capability to operate within a range of specified tolerance described in the electrical specifications. All test equipments to be used should be properly calibrated.

- 1) FM signal generator: 30 – 200 MHz
- 2) FM MPX stereo modulator
- 3) Audio signal generator: 20 – 20 kHz
- 4) Audio analyzer (Distortion meter)
- 5) Audio level meter or VTVM: 0.5 mV – 10V
- 6) Frequency counter: 200 MHz, high input impedance type
- 7) Oscilloscope: 1 mV/cm or higher
- 8) Center meter or Null meter
- 9) DC voltmeter: High input impedance type
- 10) FM dummy antenna

3. Operation and standard setting

3.1 Operation of controls and switches

- POWER** (power switch): This switch makes the secondary of the power transformer open or close. In the off mode the back-up current is available for the memory, which is indicated by LED indicator. When the power plug is taken off the AC outlet, the memory will be erased after 24 hours.
- MULTIPATH** (multipath switch): This switch is used to indicate the multipath distortion by the LED meter by depressing the switch. The FM antenna should be adjusted to achieve the minimum distortion. By releasing this switch the LED meter on front panel serves for normal signal strength indication.
- MPX-FIL** (multiplex filter): When depressed this pushbutton activates a circuit which reduces high frequency noise in weak FM stereo reception. This filter does not affect frequency response but reduces slightly the high frequency stereo separation.
- STEREO/MONO** (mode switch): Determines the manner in which a received station will be reproduced by tuner.
STEREO (released): Provides stereophonic reception of any stereo broadcast. This pushbutton also provides automatic FM stereo reception.
MONO (depressed): The left and right channel signals detected from FM broadcast are mixed and reproduced through both channels.

e) SCAN LOW/HIGH

LOW: Releasing of this pushbutton will introduce a special muting circuit which eliminates noise between stations on FM when scanning.

HIGH: Maximum reduction of background noise on weak stereo stations will be obtained by depressing the **SCAN LOW/HIGH** pushbutton. This will, of course, put high frequency component in the program material in a monophonic reproduction. In this position, the mute is switched off to prevent the tuner from switching to a mute condition due to weak signal strength.

San stop level is as shown:

FM **LOW:** 20 ± 4 dBf
 HIGH: 38 ± 3 dBf
AM **LOW:** 57 ± 2 dBu/m
 HIGH: 67 ± 3 dBu/m

f) **STH** (short-time-hold pushbutton): When depressing the **UP** or **DOWN** for automatic scanning, a pause for 5 seconds should be provided by depressing this push switch before resuming scanning. As long as this switch is depressed 5 seconds pause shall be repeated.

g) **UP/DOWN** (tuning pushbutton): When the **AUTO/MANUAL** pushbutton is set to **AUTO** position, it will start scanning either upward or downward the receive frequency.

When the **AUTO/MANUAL** pushbutton is set to **MANUAL** position, at each time of depressing either of the pushbuttons the receive frequency will be tuned to the next available station assignment by 50 kHz (U.S.A. 200 kHz) spacing for FM and 9 kHz (U.S.A. 10 kHz) spacing for AM.

Keep depressing either of pushbuttons more than 1 second, receive frequency varies serially, and stop when release the pushbutton.

h) **AUTO/MANUAL** (tuning mode pushbutton): De-

termines the mode of electronic tuning — automatic scanning (**AUTO**) or manual one-by-one tuning (**MANUAL**).

In **MANUAL** mode the receive frequency is selected channel after channel by **UP** or **DOWN** pushbutton, enabling a weak antenna input below the muting level to be received.

In **AUTO** mode scanning starts when **UP** or **DOWN** switch is depressed, scanning halts where the level of antenna input exceeds a certain value which is nearly equivalent to the muting level.

In **AUTO** scanning, scanning function prevails, defeating the memory function.

- i) **FM/AM:** Selects AM or automatic FM stereo reception. When depressed it selects automatic FM stereo reception and when released it selects AM reception.
- j) **MEMORY:** Used to preset AM and FM stations for automatic pushbutton selection. When this switch is depressed "MEMORY" is indicated for 5 seconds. By pushing in one of 7 memory preset buttons during this 5 second period the frequency on the display is memorized.
- k) **1 - 7** (preset pushbutton): Used for automatic memory pushbutton tuning on AM and FM. Each of 7 push-buttons may be preset for both AM and FM stations individually.
- l) **HOLD:** Used to stop scanning at the desired frequency while scanning automatically.

4. **Memory back-up check:** Confirm 8V at emitter of Q-25 for the back-up current while the AC power source is off. Use a low resistance tester or connect approximate 5 kOhm resistor between ± terminals when confirming the back-up current.

5.2.2 Vari-cap control voltage adjustment

- 1) Connect voltmeter between TP-4 and GND.
- 2) Depress preset-button 5 or 6 (108.0 MHz), adjust **CT-4** for **9.6V**.
- 3) Depress preset-button 1 (87.5 MHz), adjust **T-4** for **3.4V**.
- 4) Depress preset-button 5 or 6 (108.0 MHz), adjust **CT-4** for **10.0V**.
- 5) Depress preset-button 1 (87.5 MHz), adjust **T-4** for **3.4V**.
- 6) Repeat steps 4) and 5) until **10.0V ± 0.1V** is obtained at 108.0 MHz and **3.4V ± 0.2V** at 87.5 MHz.
NOTE: Use high input impedance Voltmeter.
If procedure in step 2) will not provide result as indicated, adjust T-4 first.

5.3 RF IF circuit adjustment

Connect Voltmeter (low impedance type) between TP-1 and TP-2. Output deviation of signal generator should be within ±2 kHz.

5.3.1 IF adjustment

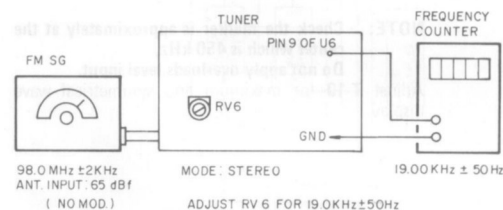
- 1) Set signal generator to 98.000 MHz, depress preset-button 3 (98.0 MHz). Adjust **T-12** for Voltmeter reading within **±20 mV**.
- 2) Connect level meter to output terminal, adjust **T-5**, **T-6** for **maximum** receive sensitivity by reducing the output of the signal generator.

5.3.2 Front End adjustment (Sensitivity adjustment)

- 1) Set signal generator to 90.000 MHz, depress preset-pushbutton 2 (90.0 MHz). Adjust **T-1**, **T-2**, **T-3** alternately for **maximum** scope display.
 - 2) Set signal generator to 106.000 MHz, depress preset-pushbutton 4 (106.0 MHz). Adjust **CT-1**, **CT-2** and **CT-3** for **maximum** scope display.
 - 3) Repeat steps 1) and 2) until maximum scope display is obtained at both frequencies.
 - 4) Adjust **CT-7** to obtain **maximum** sensitivity if wave form is not symmetrical.
- #### 5.3.3 Distortion adjustment
- 1) Set signal generator to 98.000 MHz, depress preset-button 3 (98.0 MHz).
Antenna input level: 65 dBf
 - 2) Adjust T-13 to obtained minimum distortion on THD meter.

5.4 MPX circuit adjustment

Connect MPX signal generator to standard signal generator. Test circuit sets up as shown:



5.4.2 Separation adjustment

- 1) Apply 65 dBf MPX signal to antenna input. Rotate **RV-5** for minimum reading on **right channel** Voltmeter.
 - 2) Apply 65 dBf MPX signal generator output level modulated with 1 kHz **right channel** signal to antenna input. Check for minimum reading on **left channel** Voltmeter.
 - 3) If leakage on each channel is not equal, rotate RV-7 to a point at which provides equal leakage on both channels.
- #### 5.4.3 Stereo level check
- 1) Feed signal generator modulated with standard stereo signal by MPX signal generator to antenna terminal.
 - 2) Check that stereo indicator lights up at antenna input level between 16 dBf and 24 dBf.

6. AM alignment

6.1 Receive frequency preset

Preset the following frequencies to memory before initiating adjustments:

- 1) 531 kHz
- 2) 603 kHz
- 3) 999 kHz
- 4) 1404 kHz
- 5) 1602 kHz

6.2 PLL local oscillator circuit

6.2.1 Vari-cap control voltage adjustment

- 3) Check that voltage between **TP-1** and **TP-2** is within **±20 mV** with no signal condition.

5.3.4 Muting level adjustment

- 1) Apply 38 dBf level to antenna input. Set the **AUTO/MANUAL** Selector pushbutton to **AUTO** (pushbutton released) and the **SCAN HIGH/LOW** selector to **HIGH** (pushbutton depressed). Rotate RV-1 fully clockwise (RV-1 is located on PSSW213).
- 2) Depress any one of memory preset pushbuttons, rotate RV-1 counterclockwise until mute is cancelled (when readjusting, depress the preset pushbutton each time).
NOTE: If above procedure is inadequate, rotate RV-1 to a point at which the level turns low to high.
- 3) Set the **SCAN LOW/HIGH** selector pushbutton to **LOW** (pushbutton released), then check that mute is cancelled at **20 dBf ± 4 dBf**.

5.4.1 19 kHz (76 kHz VCO) adjustment

- 1) Set **MONO/STEREO** selector pushbutton to **STEREO** (pushbutton released).
- 2) Set signal generator output to 65 dBf (no modulation).
- 3) Rotate **RV-6** for frequency reading of **19 kHz ± 50 Hz** at IC U-9 #9 pin, then fix RV-6.

5.4.4 Signal indicator adjustment

- 1) Apply 60 dBf signal to antenna input. Adjust **RV-5** so that all of 5 indicator dots light up.
- 2) Apply 20 dBf to antenna input. Check that the 1st dot lights up.
- 3) Check that no dot lights up with no antenna input.

5.4.5 Multipath indicator check

- 1) Apply 45 dBf signal AM modulated 50%. Depress **MUTIPATH** button.
- 2) Check 4 dots of indicator light up.
- 3) No dot should light up or only 1st dot may light up when readjusting signal generator to FM mode modulated with 40 kHz deviation.

- 1) Connect Voltmeter between TP-4 and GND.
- 2) Depress preset-button 5 (1602 kHz), adjust **CT-6** for **9.2V**.
- 3) Depress preset-button 1 (531 kHz), adjust **T-8** for **1.6V**.
- 4) Repeat steps 2) and 3) until **1.6V ± 0.05V** is obtained at 531 kHz and **9.2V ± 0.1V** at 1602 kHz.
NOTE: Use high input impedance Voltmeter.
If procedure in step 2) will not provide result indicated, adjust T-8 previously.

5. FM alignment

5.1 Receive frequency preset

Preset the following frequencies to memory before starting all alignment procedures:

- 1) 87.5 MHz
 - 2) 90.0 MHz
 - 3) 98.0 MHz
 - 4) 106.0 MHz
 - 5) 108.0 MHz
 - 6) 108.0 MHz
- 1) To preset memory
 - a) Frequency indicator reads either 87.5 MHz or 108.0 MHz when turning power on. Push memory preset switch from 1 - 7.
 - b) Keep depressing either **UP** or **DOWN** in **MANUAL** mode.
As the frequency approaches to the designated frequency, temporarily release the button. Then press it step by step to tune exactly to the frequency, where **MEMORY** button should be pushed before pushing one of the 7 buttons.
 - c) Check the frequencies above have been preset correctly on each pushbutton.

5.2 PLL local oscillator circuit alignment

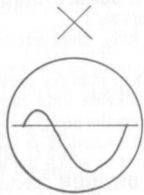
5.2.1 Reference frequency adjustment

- 1) Connect frequency counter to TP-3.
- 2) Adjust **CT-7** for **11.5200 MHz ± 100 Hz**.

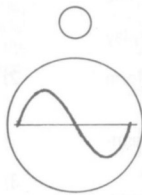
6.3 IF adjustment

Use procedure (A) or (B).

- (A) Connect IF sweep input to output jacks. Connect IF sweep to AM antenna terminal.
Adjust **T-9** for "correct" wave form as shown.



(non-linear)

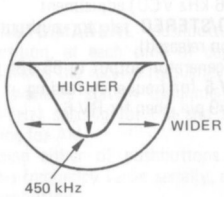


(correct)



(unsymmetrical)

- (B) Connect IF sweep input to IC U-7 #12 pin.
Connect IF sweep output to AM antenna terminal.
Adjust **T-9** for higher and wider wave form on display.



6.4 Sensitivity adjustment

- 1) Pull out bar antenna away from rear panel.
- 2) Connect test loop antenna to signal generator and locate the loop antenna 20 - 30 cm from bar antenna. Connect VTVM or level meter and oscilloscope to tuner output.
- 3) Adjust signal generator to 603 kHz, 1 kHz modulated 30%, depress preset-button 2 (603 kHz). Rotate core in bar antenna for maximum sensitivity.
- 4) Adjust signal generator to 1404 kHz, depress preset-button 4 (1404 kHz). Adjust CT-5 for maximum sensitivity.
- 5) Repeat steps 3), 4) until maximum sensitivity is obtained at both 603 kHz and 1404 kHz.
- 6) Check that the sensitivity is within the specifications at 999 kHz, and the output level is ± 3 dB.

6.5 Signal meter adjustment

Increase signal generator output to 80 dBu. Adjust RV-2 so that all of 5 indicator dots light up (use 200 pF antenna).

6.6 Scan-stop circuit adjustment

- 1) Apply 57 dBu* 999 kHz signal generator 400 Hz modulated 30% output from test loop antenna positioned

NOTE: Check the marker is approximately at the center which is 450 kHz.
Do not apply overloads level input.
Adjust **T-10** for maximum and symmetrical wave display.

60 cm from unit bar antenna.

* = Signal generator scale 83 dBu containing 26 dBu loop antenna loss.

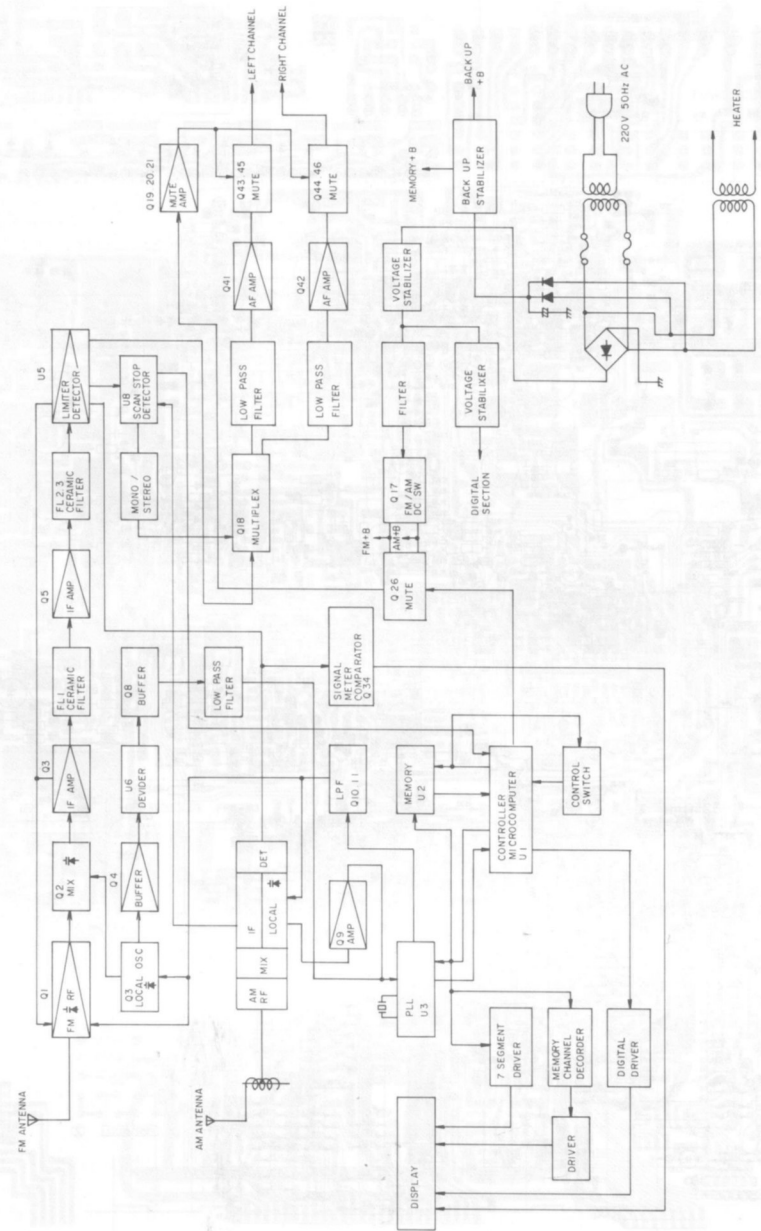
- 2) Set the unit to **AUTO** mode, **SCAN LOW/HIGH** to **LOW**. Rotate **RV-3** fully counterclockwise.
- 3) Depress preset-button, then rotate **RV-3** clockwise until the level is increased rapidly to clear wave form (or rotate **RV-3** clockwise until level of U-1 #3 pin turns high to low).
- 4) If readjustment is necessary, repeat step 3).

NOTE: a) Adjust signal generator to 999 kHz. The tolerance within ± 50 kHz is only acceptable due to the very narrow scan-stop detector band width.

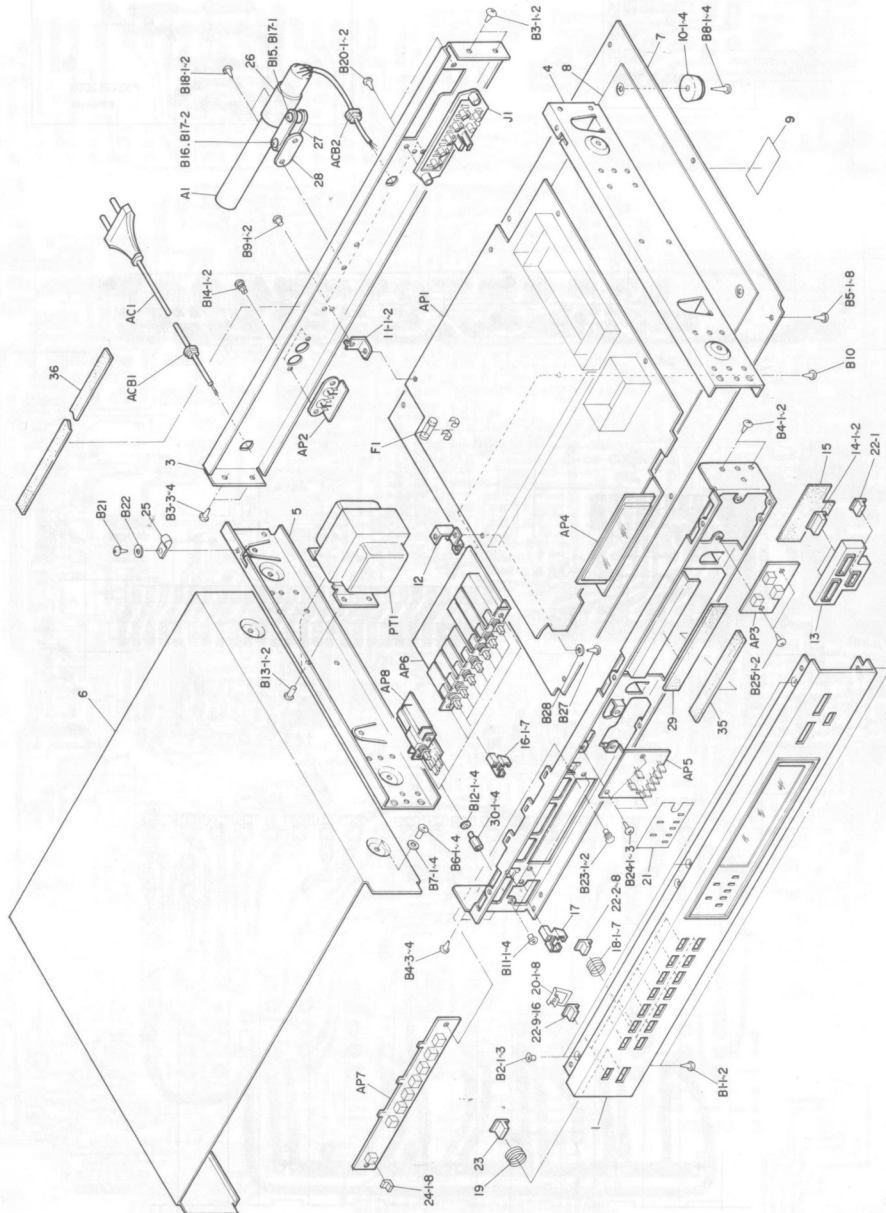
- b) Be sure to observe 400 Hz 30% modulated condition as modulation frequency and modulation ratio affect scan-stop level.
- c) Do not short-cut step 3) since scan stop signal is self-locked.

- 5) Set the **SCAN LOW/HIGH** pushbutton to **HIGH**. Adjust signal generator to 67 dBu, then rotate **RV-4** clockwise until mute is cancelled.

Block Diagram



Exploded View



CF700S (E) 80-10

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		MECH. ELEMENTS		TAA39ASML2	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	VX2225W001		ADAPTER BUTT A		16-1 16-2 16-3 16-4
2					16-5 16-6 16-7
3	VX2225W002		ADAPTER BUTT C		17
4					
5					

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		ACCESSORIES		TAA35AUCAL5	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	ACSP001GEA		ST. AUDIO CABLE		
2	ZAT0015002		ANTENNA		
3	KPCT700E01		INNER CARTON	[PACKING MATTER]	
4					
5					

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		ESCUTCHEON ASSY		AMCT700#01	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	ME95EAA013		ESCUTCHEON		1-A
2	VF174SX002		FRAME		1-B
3	VK172SB001		BUTTON GUIDE F		1-F
4	VK222SB003		BUTTON GUIDE C		1-E
5	VK272SB002		BUTTON GUIDE A		1-D
6	V5747AS003		PLATE A		1-C

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		P.W. BOARD ASSY		APSLD135AA	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	MW401CX001		SHORT JUMPER	JW-10	
2	PSLD135COX		PRINTED W. BOARD		
3	QLBLN224RN		L.E.D	LN224RP RED	LD7
4	QLBLN324GN		L.E.D	LN324GP GREEN	LD1 LD2 LD3 LD4
5					LD5 LD8
6	WP09060DGT		PC-JOINT		

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		P.W. BOARD ASSY		APSLD134AA	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	PSLD134COX		PRINTED W. BOARD		
2	ZLF1P7DBXA		F.L. INDICATOR		
3	ZZZ0000035		PC. JOINT		1/ 2

EXPLODED ASSEMBLY		PART NAME		PART CODE	
REMARKS		P.W. BOARD ASSY		AP5CT70011	
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.
1	EXPLODED	APSLD134AA	P.W. BOARD ASSY		
2	EXPLODED	APSLD135AA	P.W. BOARD ASSY		
3	EXPLODED	AP5SW212AA	P.W. BOARD ASSY		
4	EXPLODED	AP5SW213AA	P.W. BOARD ASSY		
5	EXPLODED	AP5SW214AA	P.W. BOARD ASSY		
6	EXPLODED	AP5SW215AA	P.W. BOARD ASSY		

Replacement Parts List

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	ELEC. ELEMENTS	TAA39ASMCL1	MECH. ELEMENTS	TAA39ASMCL2							
1		ACAC035EEA						AC CORD ASSY		AC1	1
2	EXPLODED	AP5CT70011						P.W.B. BOARD ASSY			1
3	EXPLODED	AP55TL8014						P.W.B. BOARD ASSY			1
4		CK0B473ZFM						CERAMIC CAP. 0.047MFD 50V -20, +20% F		C1	1
5		GCT7000A01						P.W.B. BOARD			1
6		LF151KA01T						R.F.C.		L1	1
7		TEAR120E04						BAR ANTENNA		A1	1
8		TPJ48S008Y						PWR TRANSFORMER		PT1	1
9		TV750301A2						BALANCE COIL		BA1	1
10		VM270N8004						BUSHING		ACB1 ACB2	2
11		YT005D001U						TERMINAL		J1	1
12		ZFBQ63101A						FUSE		F1	1
13		ZZZ0000154						SOLDERLESS CONN		ZZ1 ZZ2	2

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	TAA39ASMCL1	MECH. ELEMENTS	TAA39ASMCL2							
1	EXPLODED	AMCT700001						ESCUTCHEON ASSY		1	1
2		BNHCL3048N						NUT M3, 35-NI, THIN-TYPE		B17-1 B17-2	2
3		BRP3045QNB						PAN HEAD RIVET		B23-1 B23-2	2
4		BRP3055QNB						PAN HEAD RIVET 3MX5.5		B14-1 B14-2	2
5		BSPB3006NB						BIND HEAD SCREW (+)BIT, M3 X 6 S-BLACK		B9-1 B9-2	2
6		BSPC3006NZ						CENS SCREW (+)BIT, M3 X 6 S-ZNCR		B11-1 B11-2 B11-3 B11-4	4
7		BSPP3020NB						PAN HEAD SCREW (+)BIT, M3 X 20 S-BLACK		B16	1
8		BSPP3020NP						PAN HEAD SCREW (+)BIT, M3 X 20 PLASTIC		B15	1
9		BTPB5010TN						BIND TAP SCREW		B6-1 B6-2 B6-3 B6-4	4
10		BTPL3008BB						NAIL TAP SCREW (+)BIT, M3 X 8 S-BLACK		B3-1 B3-2 B3-3 B3-4	4
11		BTPP3008TZ						PAN TAP SCREW (+)BIT, M3 X 8 S-ZNCR (TAP TITE)		B13-1 B13-2 B8-1 B8-2	6
12										B8-3 B8-4	6
13		BTPS3006TZ						FLAT TAP SCREW (+)BIT, M3 X 6 S-ZNCR (TAP TITE)		B2-1 B2-2 B2-3	3
14		BTPW3008AB						BRAS TAP SCREW		B20-1 B20-2	2
15		BTPW3008BB						BRAS. TAP SCREW (+)BIT, M3 X 8 S-BLACK		B18-1 B18-2	2
16		BTPW3008BZ						BRAS. TAP SCREW (+)BIT, M3 X 8 S-ZNCR		B1-1 B1-2 B10 B21	21
17										B24-1 B24-2 B24-3 B25-1	4
18										B25-2 B4-1 B4-2 B4-3	4
19										B4-4 B5-1 B5-2 B5-3	4
20										B5-4 B5-5 B5-6 B5-7	7
21										B5-8	1

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	TAA39ASMCL1	MECH. ELEMENTS	TAA39ASMCL2							
1		BTPX3008BZ						I.T BT SCREW (+)BIT, M3 X 8 S-ZNCR		B26-1 B26-2 B26-3 B26-4	7
2										B26-5 B26-6 B26-7	7
3		BWG30655SW						OT. LOCK WASHER	OUTSIDE TOOTHED, 3M/M S-ZN	B12-1 B12-2 B12-3 B12-4	4
4		BWM30A08SN						FLAT L. WASHER	FLAT LARGE, 3 M/M S-NI	B22	1
5		BWM30B0AFR						FLAT L. WASHER	FLAT LARGE, 3 M/M RED-FIBER	B28	1
6		BWM50C08SN						FLAT L. WASHER	FLAT LARGE, 5 M/M S-NI	B7-1 B7-2 B7-3 B7-4	4
7		MB942SK006						REAR PANEL		3	1
8		MB943SX008						FRONT PANEL		2	1
9		MF422PB001						HOLDER		28	1
10		MH632PB001						HOLDER		27	1
11		ML122SX003						PCB BRACKET A		11-1 11-2	2
12		ML221LD003						SPRING F		20-1 20-2 20-3 20-4	8
13										20-5 20-6 20-7 20-8	8
14		MM480PB001						HOLDER		26	1
15		MS986SX012						BOTTOM PLATE		7	1
16		MT263BD010						SPACER SW		30-1 30-2 30-3 30-4	4
17		MUB41SX001						SIDE BRACKET L		5	1
18		MUB41SX002						SIDE BRACKET R		4	1
19		MUB955M005						COVER		6	1
20		MW271LY004						SPRING A		18-1 18-2 18-3 18-4	7
21										18-5 18-6 18-7	7

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	MECH. ELEMENTS	TAA39ASMCL1	MECH. ELEMENTS	TAA39ASMCL2							
1		MW271LY005						SPRING C		19	1
2		MZ232SX004						PCB. BRACKET B		12	1
3		VK1115B002						ADAPTER SW		24-1 24-2 24-3 24-4	8
4										24-5 24-6 24-7 24-8	8
5		VK264S003						BUTTON GUIDE B		13	1
6		VM1835B002						FOOT		10-1 10-2 10-3 10-4	4
7		VN220AX001						BUTTON A		22-1 22-10 22-11 22-12	16
8										22-13 22-14 22-15 22-16	16
9										22-2 22-3 22-4 22-5	5
10										22-6 22-7 22-8 22-9	9
11		VN220AX002						BUTTON B		14-1 14-2	2
12		VN220AX003						BUTTON C		23	1
13		VS229RB001						PAD BOTTOM		37	1
14		VS417NN003						CLAMPER.		25	1
15		VS435CN002						LED GUIDE		21	1
16		VS614FF001						FIBER FL		35	1
17		VS617RF001						SPONGE FL		29	1
18		VS646RW001						SPONGE TUNING		15	1
19		VS8845B004						BOTTOM SHEET		8	1
20		VS918RF001						SPONGE SPACER		36	1
21		VV5CT00E1						SER.NO.PLATE		9	1

EXPLODED ASSEMBLY	PART NAME		PART CODE		PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD	ASSY	AP55W212AA					
REMARKS	PART CODE	PART STOCK NUMBER						
1	MW401CX003				SHURT JUMPER			1
2	PSCT7001CX				PRINTED W.BOARD			1
3	PSSW212COX				P.W BORD			1
4	QDSMA150XN				SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1 D2	2
5	SP01ABX44A				PUSH SWITCH		S1 S2 S3	3
6	ZZZ0000035				PC JOINT			1/ 12
7								
8								
9								
10								
11								
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21								

EXPLODED ASSEMBLY	PART NAME		PART CODE		PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD	ASSY	AP55W214AA					
REMARKS	PART CODE	PART STOCK NUMBER						
1	ACCN303ULA				CONN CORD ASSY			1
2	ACCN413ULA				CONN CORD ASSY	6P L=200		1
3	PSSW214COX				P.W.BOARD			1
4	QDSMA150XN				SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1 D2 D3 D4	8
5							D5 D6 D7 D8	
6	QLAP6531R				L.E.D.	PG5531KY GREEN 2.1V	LD1 LD2 LD3 LD4	7
7							LD5 LD6 LD7	
8	SP01ABX44A				PUSH SWITCH		S1 S2 S3 S4	8
9							S5 S6 S7 S8	

EXPLODED ASSEMBLY	PART NAME		PART CODE		PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD	ASSY	AP55W215AA					
REMARKS	PART CODE	PART STOCK NUMBER						
1	MW201B5001				TERMINAL			4
2	PSSW215COX				P.W.BOARD			1
3	QLBLN417YN				L.E.D.DIODE	LN417YP ORANGE	L01 L02	2
4	RG1ARJ152B				M-OXIDE FILM R.		R1	1
5	SP01AAX46D				PUSH SWITCH		S1	1
6								
7								
8								
9								

EXPLODED ASSEMBLY	PART NAME		PART CODE		PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD	ASSY	AP55W213AA					
REMARKS	PART CODE	PART STOCK NUMBER						
1	CQMB332KEH				MYLAR CAPACITOR	3300PF 50V -10, +10%	C1	1
2	MW201B5001				TERMINAL			22
3	MW401CX001				SHURT JUMPER	JW-10		4
4	PSSW213COX				P.W BORD			1
5	QDSMA150XN				SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D1 D2 D3	3
6	QLBLN317GN				L.E.D.	LN317GP GREEN	LD1 LD2 LD3 LD4	5
7							L05	
8	QTA0684XAN				TRANSISTOR	25A683 Q,R-RANK	Q1	1
9	RD25TJ105X				CARBON FILM R.	0.25W 1M OHM 5%	R3	1
10	RD25TJ432X				CARBON FILM R.	0.25W 0.3K OHM 5%	R1 R2	2
11	RD25TJ512X				CARBON FILM R.	0.25W 5.1K OHM 5%	R5	1
12	RD25VJ560X				CARBON FILM R.	0.25W 56 OHM 5%	R4	1
13	RPGBN50201				SEMI-FIXED VR.	5K OHM B-CURVE	RV1	1
14	SP07CAX04A				PUSH SWITCH		S1	1
15								
16								
17								
18								
19								
20								
21								

EXPLODED ASSEMBLY	PART NAME		PART CODE		PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.	QTY USED
	P.W.BOARD	ASSY	APSTU0550D					
REMARKS	PART CODE	PART STOCK NUMBER						
1	BTPW300BAZ				BRAS. TAP SCREW (+)BIT, M3 X 8	S-ZNCR	B1	1
2	CCDB040CCM				CERAMIC CAP.	CH 4PF 50V -0.25, +0.25PF	C29	1
3	CCDB060CQM				CERAMIC CAP.	SL 6PF 50V -0.25, +0.25PF	C51	1
4	CCDB070DDM				CERAMIC CAP.	SL 7PF 50V -0.5, +0.5PF	C1	1
5	CCDB100DCM				CERAMIC CAP.	CH 10PF 50V -0.5, +0.5PF	C23 C27	2
6	CCDB100DDM				CERAMIC CAP.	SL 10PF 50V -0.5, +0.5PF	C31	1
7	CCDB120KOM				CERAMIC CAP.	12PF 50V -10, +10% SL	C13 C170 C8	3
8	CCDB220KOM				CERAMIC CAP.	22PF 50V -10, +10% SL	C15	1
9	CCDB330CKM				CERAMIC CAP.	33PF 50V -10, +10% CH	C24	1
10	CCDB330KUM				CERAMIC CAP.		C25	1
11	CCDB471KOM				CERAMIC CAP.	470PF 50V -10, +10% SL	C30	1
12	CCDB680KOM				CERAMIC CAP.	68PF 50V -10, +10% SL	C38	1
13	CCDB820KOM				CERAMIC CAP.	82PF 50V -10, +10% SL	C37	1
14	CCFB151KOT				CERAMIC CAP.	150PF 50V -10, +10% SL	C89	1
15	CCFB221KOT				CERAMIC CAP.	220PF 50V -10, +10% SL	C163	1
16	CCGB101KOT				CERAMIC CAP.	100PF 50V -10, +10% SL	C115 C116 C118 C122	4
17	CCGB220KOT				CERAMIC CAP.	22PF 50V -10, +10% SL	C106	1
18	CCGB270KOT				CERAMIC CAP.	27PF 50V -10, +10% SL	C50	1
19	CCGB330KOT				CERAMIC CAP.	33PF 50V -10, +10% SL	C156 C61	2
20	CCGB470KOT				CERAMIC CAP.	47PF 50V -10, +10% SL	C73	1
21	CCGB560KOT				CERAMIC CAP.	56PF 50V -10, +10% SL	C41 C84	2

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W. BOARD ASSY	APSTU055DD												
1						CEAC221ALX		ELYT. CAPACITOR	220MFD 10V	C184				1
2						CEAD101ALX		ELYT. CAPACITOR	100MFD 15V	C181				1
3						CEAD221ALX		ELYT. CAPACITOR	220MFD 16V	C113	C121	C175	C182	6
4										C20	C21			
5						CEAD470ALX		ELYT. CAPACITOR	47MFD 16V	C97				1
6						CEAE100NLX		ELYT. CAPACITOR		C149				1
7						CEAGR22ZMN		ELYT. CAPACITOR	0.22MFD 50V MS	C112				1
8						CEAG010ZMN		ELYT. CAPACITOR	1MFD 50V MS	C165				1
9						CEAG101ALX		ELYT. CAPACITOR	100MFD 50V	C172	C173			2
10						CEAG102ACN		ELYT. CAPACITOR	1000MFD 50V U	C171				1
11						CEVC220ALX		ELYT. CAPACITOR		C154	C160	C179		3
12						CEVC470ALX		ELYT. CAPACITOR		C183				1
13						CEVD100ALX		ELYT. CAPACITOR		C119	C120	C123	C124	10
14										C127	C128	C56	C69	
15										C76	C77			
16						CEVD101ALX		ELYT. CAPACITOR		C64				1
17						CEVD470ALX		ELYT. CAPACITOR		C166	C185	C83		3
18						CEVE3R3ALX		ELYT. CAPACITOR		C110				1
19						CEVE4R7ALX		ELYT. CAPACITOR		C107	C117	C145	C146	6
20										C63	C81			
21						CEVGR47ALX		ELYT. CAPACITOR		C158	C178	C180		3

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W. BOARD ASSY	APSTU055DD												
1										C79	C88	C90	C93	
2										C94				
3						CKFB473ZFM		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C98				1
4						CKFB473ZFT		CERAMIC CAP.	0.047MFD 50V -20, +80% F	C108	C157	C159	C161	12
5										C190	C191	C58	C59	
6										C60	C65	C85	C91	
7						CKGB472ZFT		CERAMIC CAP.	4700PF 50V -20, +80% F	C44				1
8						CKGB681KBT		CERAMIC CAP.		C141	C142			2
9						CQMB102KTH		MYLAR CAPACITOR	1000PF 50V -10, +10%	C129	C130			2
10						CQMB103KEH		MYLAR CAPACITOR	0.01MFD 50V -10, +10%	C78				1
11						CQMB122JEH		MYLAR CAPACITOR	1200PF 50V -5, +5%	C125	C126			2
12						CQMB152KTH		MYLAR CAPACITOR		C137	C138			2
13						CQMB222KTH		MYLAR CAPACITOR	2200PF 50V -10, +10%	C133	C134			2
14						CQMB223KTH		MYLAR CAPACITOR	0.022MFD 50V -10, +10%	C104	C80			2
15						CQMB333KTH		MYLAR CAPACITOR	0.033MFD 50V -10, +10%	C164				1
16						CQMB563KTH		MYLAR CAPACITOR	0.056MFD 50V -10, +10%	C152				1
17						CQMB683KEH		MYLAR CAPACITOR	0.068MFD 50V -10, +10%	C103				1
18						CQSC102JCF		STYROFLEX CAP.		C135	C136			2
19						CQSC182JCF		STYROFLEX CAP.	1800PF 100V -5, +5%	C139	C140			2
20						CQSC251JCF		STYROFLEX CAP.		C131	C132			2
21						CQSC471JCF		STYROFLEX CAP.	470PF 100V -5, +5%	C109	C86			2

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W. BOARD ASSY	APSTU055DD												
1						CEVG010ALX		ELYT. CAPACITOR		C111	C114	C143	C144	10
2										C147	C186	C187	C62	
3										C66	C68			
4						CG2H3R9KPB		MINIC CAP.		C26				1
5						CKDB102ZFM		CERAMIC CAP.	1000PF 50V -20, +80% F	C4	C7			2
6						CKDB103ZFM		CERAMIC CAP.	0.01MFD 50V -20, +80% F	C10	C11	C12	C14	16
7										C18	C188	C2	C22	
8										C28	C3	C33	C36	
9										C39	C40	C6	C9	
10						CKDB152KBM		CERAMIC CAP.		C32				1
11						CKDB223ZFM		CERAMIC CAP.	0.022MFD 50V -20, +20% F	C16	C17	C19		3
12						CKDB472ZFM		CERAMIC CAP.	4700PF 50V -20, +80% F	C35	C5			2
13						CKDB473ZFM		CERAMIC CAP.	0.047MFD 50V -20, +20% F	C196	C34	C74		3
14						CKDE103PEM		CERAMIC CAP.	0.01MFD 500V -0, +100% E	C189				1
15						CKFB103ZFT		CERAMIC CAP.	0.01MFD 50V -20, +80% F	C105	C148	C155	C42	10
16										C72	C82	C87	C92	
17										C95	C96			
18						CKFB223ZFT		CERAMIC CAP.	0.022MFD 50V -20, +80% F	C101	C102	C150	C151	21
19										C43	C45	C46	C47	
20										C48	C49	C52	C53	
21										C54	C55	C71	C75	

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W. BOARD ASSY	APSTU055DD												
1						CTX1080P06		TRIMMER CAP.		CT1	CT2	CT3		3
2						CTX1150P01		TRIMMER CAP.		CT5	CT6			2
3						CTZ6100H01		TRIMMER CAP.		CT4				1
4						CTZ6300H02		TRIMMER CAP.		CT7				1
5						FBR450A01M		CERAMIC FILTER		FL4	FL5			2
6						FB10R7F20M		CERAMIC FILTER		FL1	FL2	FL3		3
7						LCADA3038A		RF COIL		L11	L13	L15	L7	6
8										L8	L9			
9						LF151KA01T		R.F.C.		L10	L12			2
10						LF180JC01K		RF COIL		L16				1
11						LF393JC01K		CHOKE COIL		L5	L6			2
12						LF563JC01K		RF COIL		L3	L4			2
13						LF683JC01K		CHOKE COIL		L1	L2			2
14						MB644SX001		SHIELD		SL5				1
15						MB763SS001		SHIELD.A		SL1				1
16						MS4355S004		SHIELD		SL9				1
17						MS6355S002		SHIELD.B		SL2	SL3			2
18						MS6455S002		SHIELD E		SL4	SL6	SL7		3
19						MS8255S001		PLATE		SL8				1
20						MU242AD001		HEAT SINK		HS1				1
21						MW201BS001		TERMINAL						41

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P+W+BOARD	ASSY	APSTU055DD							D5	D6			
1								SHORT JUMPER	JW-10					6
2								SHORT JUMPER						2
3								SHORT JUMPER	JW-5					2
4								SHORT JUMPER	JW-15					2
5								SHORT JUMPER	10MM				116	
6								SHORT JUMPER						1
7								SHORT JUMPER						1
8								PRINTED W+BOARD	PRINTED P. BOARD ONLY					1
9								P+W+BOARD						1
10								VRRICAP+DIODE		D5	D6			2
11								VARICAP DIODE		D1	D2	D3	D4	4
12								GERMANIUM DIODE	IN60 NO-RANK	D10	D11	D65	D66	4
13								SILICON DIODE	EMIZ <SANKEN>	D35	D36			2
14								SILICON DIODE	MA150 VF=1.2V,VR=35V NO-RANK 24MIN	D12	D13	D14	D15	3
15										D16	D17	D18	D19	
16										D20	D21	D22	D23	
17										D24	D25	D26	D27	
18										D28	D29	D34	D38	
19										D43	D44	D51	D52	
20										D53	D55	D56	D57	
21										D58	D59	D60	D61	

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P+W+BOARD	ASSY	APSTU055DD							Q48	Q49	Q50	Q51	
1										Q48	Q49	Q50	Q51	
2										Q52	Q53	Q54	Q55	
3								TRANSISTOR	25C900 U-RANK	Q10	Q11			2
4								TRANSISTOR	25C945A P+Q-RANK	Q12	Q16	Q17	Q18	15
5										Q19	Q21	Q22	Q24	
6										Q25	Q26	Q34	Q43	
7										Q44	Q6	Q7		
8								TRANSISTOR	25C1674 L-RANK	Q3	Q4			2
9								TRANSISTOR	25C1675 K+L-RANK	Q5	Q8	Q9		3
10								TRANSISTOR	25C1826 O, Y-RANK NO ACCESSORIES	Q28				1
11								TRANSISTOR	25C1845 E+F-RANK	Q41	Q42			2
12								TRANSISTOR	25C1846 Q+R+S-RANK	Q30	Q33			2
13								TRANSISTOR	25D636 Q+R-RANK	Q23				1
14								TRANSISTOR		Q27				1
15								TRANSISTOR GR	25K30 OR 25K30A GR-RANK	Q57				1
16								TRANSISTOR	25K68 L+M-RANK	Q32				1
17								TRANSISTOR	35K45 B-RANK	Q1				1
18								TRANSISTOR	35K49 Q-RANK	Q2				1
19								CARBON FILM R.	0.25W 10 OHM 5%	R281				1
20								CARBON FILM R.	0.25W 100 OHM 5%	R18	R20	R26	R270	9
21										R4	R41	R53	R8	

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P+W+BOARD	ASSY	APSTU055DD							D62	D63	D7	D8	
1										D62	D63	D7	D8	
2										D9				
3								SI-DIODE	SIRDA	D31				1
4								ZENER DIODE	MA1047 VZ=4.4-5.0V NDM.=4.7V	D30				1
5								ZENER DIODE	MA1075 VZ=7.0-7.9V NDM.=7.5V	D42				1
6								ZENER DIODE	RD15E93 VZ=14.35-15.09V	D41				1
7								ZENER DIODE	RD4.3EB1 VZ=4.04-4.29V	D32				1
8								ZENER DIODE	RD5R6E83 VZ=5.61-5.91V	D37	D45			2
9								I.C.	AN6821 9-PIN 1/20 DIVIDER	U6				1
10								I.C.		U1				1
11								I.C.	UPC555H	U4				1
12								I.C.	UPC1161C	U9				1
13								I.C.	UPC1178C	U7				1
14								I.C.		U10				1
15								I.C.	HA11225 FM-IF SYSTEM	U5				1
16								I.C.	MN1203 256-BIT C-MOS STATIC RAM	U2				1
17								I.C.	MN6142 16-PIN RADIO PLL SYNTHESIZER	U3				1
18								I.C.	UPD4049	U8				1
19								I.C.		U11	U12			2
20								TRANSISTOR	25A564A Q+R-RANK	Q31				2
21								TRANSISTOR	25A733 P+Q-RANK	Q13	Q20	Q45	Q46	12

EXPLODED ASSEMBLY	PART NAME		PART CODE		REMARKS	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P+W+BOARD	ASSY	APSTU055DD							R91				
1										R91				
2								CARBON FILM R.	0.25W 1K OHM 5%	R108	R134	R266		3
3								CARBON FILM R.	0.25W 10K OHM 5%	R10	R103	R113	R115	26
4										R117	R118	R198	R199	
5										R200	R201	R202	R203	
6										R204	R22	R231	R232	
7										R233	R234	R235	R238	
8										R245	R73	R74	R83	
9										R85	R9			
10								CARBON FILM R.	0.25W 100K OHM 5%	R1	R101	R107	R122	10
11										R13	R159	R160	R24	
12										R6	R7			
13								CARBON FILM R.	0.25W 1M OHM 5%	R14	R3	R59		3
14								CARBON FILM R.	0.25W 1.2K OHM 5%	R61				1
15								CARBON FILM R.	0.25W 12K OHM 5%	R147	R148	R21	R76	4
16								CARBON FILM R.	0.25W 120K OHM 5%	R12	R2			2
17								CARBON FILM R.	0.25W 150 OHM 5%	R269				1
18								CARBON FILM R.	0.25W 1.5K OHM 5%	R165	R166	R23	R90	4
19								CARBON FILM R.	0.25W 15K OHM 5%	R120	R143	R144	R242	4
20								CARBON FILM R.	0.25W 150K OHM 5%	R135	R72			2
21								CARBON FILM R.	0.25W 180 OHM 5%	R246				1

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED
	P.W.B.O.A.R.D	A.S.S.Y					APSTU0550D				
1			RD25PJ182X		CARBON FILM R.	0.25W 1.8K OHM 5%	R116				1
2			RD25PJ183X		CARBON FILM R.	0.25W 18K OHM 5%	R126	R128	R63		3
3			RD25PJ184X		CARBON FILM R.	0.25W 180K OHM 5%	R106				1
4			RD25PJ220X		CARBON FILM R.	0.25W 22 OHM 5%	R5				1
5			RD25PJ221X		CARBON FILM R.	0.25W 220 OHM 5%	R46				1
6			RD25PJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R60	R75	R81		3
7			RD25PJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R131	R136	R141	R142	22
8							R205	R206	R207	R208	
9							R209	R210	R211	R212	
10							R213	R214	R215	R216	
11							R217	R218	R265	R43	
12							R49	R58			
13			RD25PJ224X		CARBON FILM R.	0.25W 220K OHM 5%	R54	R78			2
14			RD25PJ225X		CARBON FILM R.	0.25W 2.2M OHM 5%	R109				1
15			RD25PJ271X		CARBON FILM R.	0.25W 270 OHM 5%	R138	R55			2
16			RD25PJ272X		CARBON FILM R.	0.25W 2.7K OHM 5%	R155	R156			2
17			RD25PJ273X		CARBON FILM R.	0.25W 27K OHM 5%	R133	R151	R152	R25	9
18							R62				
19			RD25PJ274X		CARBON FILM R.	0.25W 270K OHM 5%	R172	R272	R273	R71	9
20							R87				
21			RD25PJ331X		CARBON FILM R.	0.25W 330 OHM 5%	R132	R259			2

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED	
	P.W.B.O.A.R.D	A.S.S.Y					APSTU0550D					
1										R57		
2			RD25PJ683X		CARBON FILM R.	0.25W 68K OHM 5%	R15					1
3			RD25PJ821X		CARBON FILM R.	0.25W 820 OHM 5%	R123	R17	R89			3
4			RD25PJ822X		CARBON FILM R.	0.25W 8.2K OHM 5%	R153	R154	R171			3
5			RD25PJ823X		CARBON FILM R.	0.25W 82K OHM 5%	R48	R86				2
6			RD25PJ911X		CARBON FILM R.	0.25W 910 OHM 5%	R157	R158				2
7			RD25TJ103X		CARBON FILM R.	0.25W 10K OHM 5%	R84					1
8			RD25TJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R82					1
9			RD25TJ222X		CARBON FILM R.	0.25W 2.2K OHM 5%	R260					1
10			RD25TJ223X		CARBON FILM R.	0.25W 22K OHM 5%	R114					1
11			RD25TJ272X		CARBON FILM R.	0.25W 2.7K OHM 5%	R243					1
12			RD25TJ330X		CARBON FILM R.	0.25W 33 OHM 5%	R267					1
13			RD25TJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R130					1
14			RD25TJ393X		CARBON FILM R.	0.25W 39K OHM 5%	R177	R178	R180	R282		4
15			RD25TJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R174					1
16			RD25TJ561X		CARBON FILM R.	0.25W 560 OHM 5%	R261					1
17			RD25TJ681X		CARBON FILM R.	0.25W 680 OHM 5%	R258					1
18			RD25VJ102X		CARBON FILM R.	0.25W 1K OHM 5%	R121					1
19			RD25VJ104X		CARBON FILM R.	0.25W 100K OHM 5%	R274					1
20			RD25VJ105X		CARBON FILM R.	0.25W 1M OHM 5%	R173					1
21			RD25VJ391X		CARBON FILM R.	0.25W 390 OHM 5%	R31					1

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED	
	P.W.B.O.A.R.D	A.S.S.Y					APSTU0550D					
1			RD25PJ332X		CARBON FILM R.	0.25W 3.3K OHM 5%	R28	R88				2
2			RD25PJ333X		CARBON FILM R.	0.25W 33K OHM 5%	R105	R80				2
3			RD25PJ362X		CARBON FILM R.	0.25W 3.6K OHM 5%	R64					1
4			RD25PJ364X		CARBON FILM R.	0.25W 360K OHM 5%	R219					1
5			RD25PJ392X		CARBON FILM R.	0.25W 3.9K OHM 5%	R161	R162	R163	R164		6
6							R237	R244				
7			RD25PJ393X		CARBON FILM R.	0.25W 39K OHM 5%	R110	R111	R179	R56		4
8			RD25PJ394X		CARBON FILM R.	0.25W 390K OHM 5%	R239					1
9			RD25PJ433X		CARBON FILM R.	0.25W 43K OHM 5%	R77					1
10			RD25PJ470X		CARBON FILM R.	0.25W 47 OHM 5%	R11	R19	R275	R42		4
11			RD25PJ471X		CARBON FILM R.	0.25W 470 OHM 5%	R251	R27	R45	R50		5
12							R52					
13			RD25PJ472X		CARBON FILM R.	0.25W 4.7K OHM 5%	R112	R137	R175	R176		7
14							R181	R182	R183			
15			RD25PJ473X		CARBON FILM R.	0.25W 47K OHM 5%	R124	R125	R127	R129		9
16							R145	R146	R264	R29		
17							R30					
18			RD25PJ474X		CARBON FILM R.	0.25W 470K OHM 5%	R104	R16	R47			3
19			RD25PJ562X		CARBON FILM R.	0.25W 5.6K OHM 5%	R119	R139	R271	R44		4
20			RD25PJ564X		CARBON FILM R.	0.25W 560K OHM 5%	R102					1
21			RD25PJ682X		CARBON FILM R.	0.25W 6.8K OHM 5%	R149	R150	R236	R263		5

EXPLODED ASSEMBLY	PART NAME		PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.				QTY USED	
	P.W.B.O.A.R.D	A.S.S.Y					APSTU0550D					
1			RD25VJ562X		CARBON FILM R.	0.25W 5.6K OHM 5%	R66					1
2			RGHARJ272B		M-OXIDE FILM R.		R268					1
3			RGHARJ561B		M-OXIDE FILM R.		R241					1
4			RG1ANJ680B		M-OXIDE FILM R.	1W 68 OHM 5%	R185					1
5			RG3ARJ330B		M-OXIDE FILM R		R257					1
6			RPGNB20201		SEMI-FIXED VR.	2K OHM B-CURVE	RV2	RV3				2
7			RPGNB20301		SEMI-FIXED VR.	20K OHM B-CURVE	RV5					1
8			RPGNB20401		SEMI-FIXED VR.	200K OHM B-CURVE	RV7					1
9			RPJNB10306		SEMI FIXED VR.		RV6					1
10			RPJNB50102		SEMI-FIXED VR.		RV4					1
11			THG24B001W		HEATER TRANS.		T11					1
12			TRAT7J2007S		RF COIL		T1					1
13			TR078A002S		I.F.T.		T10	T9				2
14			TR10MA013S		I.F.T.		T5	T6				2
15			TR10MM018K		RF COIL		T12					1
16			TR10MM019K		RF COIL		T13					1
17			TR10MQ003M		RF COIL		T2	T3				2
18			TR10MQ005M		RF COIL		T4					1
19			TR10M2004S		I.F.T.		T8					1
20			VVL211GE84		FUSE LABEL	T630MA						1
21			WDH824EEJJ		COAXIAL CABLE		ND43					1

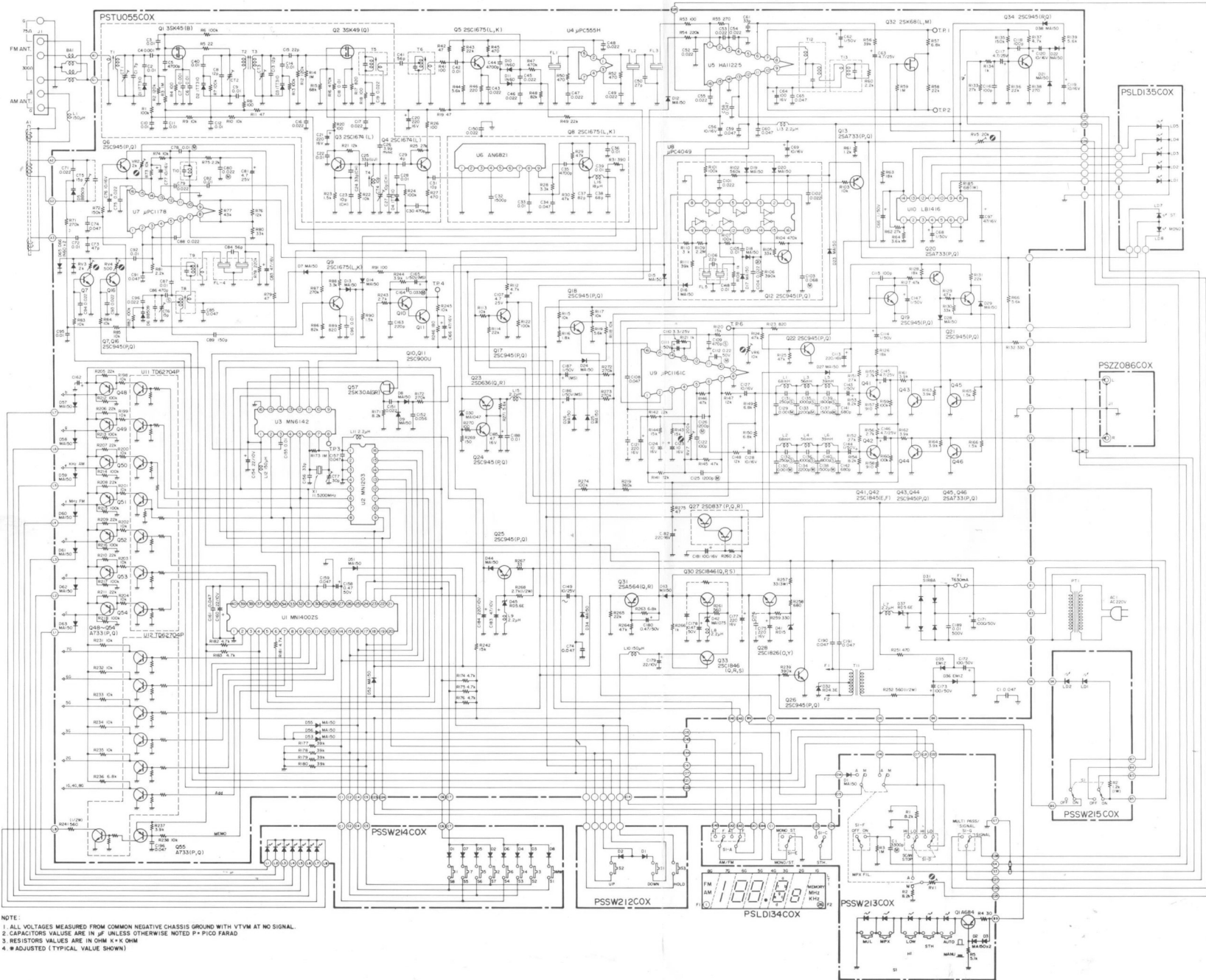
NOTE.

EXPLODED ASSEMBLY		PART NAME		PART CODE			
REMARKS		P.W. BOARD ASSY	APSTU055DD				
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		
1	WDH833EEJJ		COAXIAL CABLE		NO44		1
2	WP05250DGT		PC JOINT		JU2		1
3	WP07180DGT		PC JOINT		JU1		1
4	WUGP17EEEX		HI-WRAP WIRE		NO14		1
5	WUG016EEEX		HI-WRAP WIRE		NO15		1
6	WUG016KXXX		HI-WRAP WIRE		NO42		1
7	WUG111EEEX		HI-WRAP WIRE		NO1		1
8	WUG117EEEX		HI-WRAP WIRE		NO10		1
9	WUG125EEEX		HI-WRAP WIRE		NO55		1
10	WUG209B9XX		HI-WRAP		NO13		1
11	WUG245EEEX		HI-WRAP WIRE		NO2		1
12	WUG308FFXX		HI-WRAP WIRE		NO41		1
13	WUG313EEEX		HI-WRAP WIRE		NO11		1
14	WUG343EEEX		HI-WRAP WIRE		NO3		1
15	WUG423EEEX		HI-WRAP WIRE		NO4		1
16	WUG509EEEX		HI-WRAP WIRE		NO5		1
17	WUG634EEEX		HI-WRAP		NO6		1
18	WUG712EEEX		HI-WRAP WIRE		NO7		1
19	WUG824EEEX		HI-WRAP WIRE		NO8		1
20	WUG915EEEX		HI-WRAP WIRE		NO16		1
21	WUG940EEEX		HI-WRAP		NO12		1

EXPLODED ASSEMBLY		PART NAME		PART CODE			
REMARKS		P.W. BOARD ASSY	APSTU055DD				
QTY USED	PART CODE	PART STOCK NUMBER	PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		
1	WHF245JJ55		SHIELDED WIRE		NO45		1
2	XAZ1B4001X		XTAL OSCILLATOR		X1		1
3	YFLO000004		FERRITE BEAD				1
4	YHFD00001Z		FUSE HOLDER		FH1 FH2		2
5	YJF065003Z		JUNCTION JACK	B6P-SHF-1AA	Y2		1
6	YJF085003Z		JUNCTION JACK	B8P-SHF-1AA	Y1		1
7	ZZZ0000036		F-BRAID WIRE				2
8	APSTU055DD		P.W. BOARD ASSY	P.W. BOARD ASSEMBLY			1
9							

EXPLODED ASSEMBLY		PART NAME		PART CODE			
REMARKS		P.W. BOARD ASSY	APSZZ086AA				
QTY USED	CYBERNET PART CODE	CUSTOMER'S PART STOCK NUMBER	CYBERNET PART NAME	SPECIFICATIONS	SYMBOLIC OR EXPLODED VIEW NO.		
1	PSZZ086COX		P.W. BOARD	PRINTED W. BOARD ONLY			1
2	YJF025009U		2P PIN JACK		J1		1
3	APSZZ086AA		P.W. BOARD ASSY	PRINTED W. BOARD ASSEMBLY			1
4							
5							
6							
7							
8							
9							

Schematic Diagram



NOTE:
 1. ALL VOLTAGES MEASURED FROM COMMON NEGATIVE CHASSIS GROUND WITH VTVM AT NO SIGNAL.
 2. CAPACITORS VALUE ARE IN μF UNLESS OTHERWISE NOTED P = PICO FARAD
 3. RESISTORS VALUES ARE IN OHM \times K OHM
 4. * ADJUSTED (TYPICAL VALUE SHOWN)

TRANSISTORS



25C1846



25C1826
25D837



25D636

BOTTOM VIEW



25C900
25C945
25C675
25A733
25A564
25C685
25A790
25C828
25C1845

E - EMITTER
C - COLLECTOR
B - BASE

FET

BOTTOM VIEW



35K45
35K49

1 - DRAIN
2 - GATE 2
3 - GATE 1
4 - SOURCE

25K68



25K30

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