Personal Prop. P. BARTOL

JERROLD

PLANNED MAINTENANCE PROCEDURE

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A SYSTEM MAINTENANCE PLAN

INTRODUCTION

A plan is presented for maintenance of a Jerrold Community Television System with the objective of achieving maximum reliability at minimum expense. Correctly applied, the plan will minimize interruptions of service and maintain picture quality at an acceptable standard. The essentials of the Plan are:

I. Performing a summation sweep of the System from antenna to last trunk line amplifier. The overall system response should be aligned flat and the individual amplifier response curves should be permanently recorded.

II. Periodic rotation and inspection of amplifiers.

III. Routine balancing and field inspection of amplifiers.

IV. Maintenance of distribution equipment.

V. Antenna Site Maintenance.

The appendices included at the end provide essential and useful information for application of the Plan.

The purpose of this manual is to provide a procedure for routine checking and balancing along with the necessary records and forms, and although a few techniques and technical points are discussed, it is not the intention of this manual.

A complete and comprehensive coverage of technical data, trouble shooting techniques and general information will be achieved in a forthcoming manual.

I

SUMMATION SWEEP OF HEAD-END AND TRUNK SYSTEM

101 General

A summation sweep of the system is accomplished by locating a sweep generator at the head-end and progressively observing the response through each succeeding unit of trunk line equipment.

At each amplifier location, the alignment is touched up to compensate for tilt introduced by the preceding cable.

Discrepancies caused by defective cable, TP pads, splices, etc. will be disclosed so that corrective measures can be taken. In systems where each reel of cable was swept during manufacturing, and/or before installation, and each amplifier was aligned as a unit for proper tilt, response discrepancies will have been kept to a minimum.

A sketch is made of the final response curve of each amplifier strip. These provide a permanent record of the individual tilts and bandwidths necessary to provide the proper overall system response.

The purpose of this summation response observation is to locate and correct equipment and cable discrepancies and obtain the above mentioned amplifier response data prior to executing a planned maintenance program.

102 Test Equipment

102.1 Sweep Generators

The summation sweep and recording of individual response curves can be accomplished as one operation if two sweep generators are available. Any standard generators used for TV alignment can be used. These should have at least 10 mc. deviation and an adjustable center frequency control with a tuning range from 50 to 100 mc. for "W" systems, and 20 to 100 mc. for "K" systems.

1a Front-end generator

This unit is located at the head-end of the system and used for the summation alignment. A desirable, but not essential, characteristic of this unit would be a wide band deviation of 40 or 50 mc.*. This would permit the generator to sweep unattended over the entire "W" band. In the absence of such a sweep, a standard TV alignment and a 60 cycle, or adjustable sweep rate generator with a very flat output, can be used.

1b Service vehicle generator

This unit mounted in the service vehicle will be used to exhibit the individual amplifier response curves. A recommended unit is a combination sweep, marker and oscilloscope model such as the 7008 (Philco), Genescope (Simpson), or equivalent.

* Kay Mega Sweep, Model 111A or equivalent

Radio communication by means of two-way handy-talkie equipment is extremely desirable.

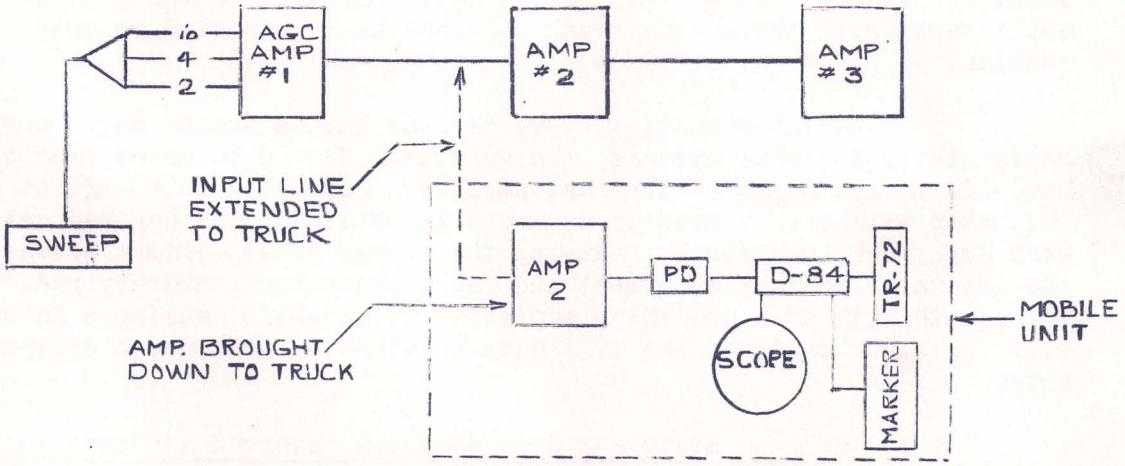
An alternate method is to designate a starting time after which a channel change is made every five minutes. Thus, at the designated starting time the response is touched up as necessary. In five minutes, the man stationed at the head-end sweep generator changes the center frequency to Channel 4 and the process repeated; so on with Channel 6, etc. If a strip is not completed on the first cycle, it can be gone over on the second time around. Break times and stopping times should also be pre-arranged.

104.3 Input Mixing First Amplifier

The summation sweep of the trunk system will start at the input to the first AGC amplifier. It is expedient to have a mixed input on this amplifier. Use a 1503 between the sweep and the amplifier, or substitute a standby AGC amplifier aligned flat with mixed inputs.

104.4 Summation Sweep Procedure

The first amplifier is aligned flat and the output fed into the trunk line. The generator is left in this location and the mobile unit proceeds to the next reamplifier where the input trunk is extended down into the truck and the amplifier brought down. The input is connected to the amplifier and the output is observed on the scope. The amplifier is then realigned for a flat response, compensating for the tilt introduced by the cable. Markers are inserted into the detector marker input to identify the response curves or any portion of a curve.



(Figure 3)

104.5 Recording Response Curves (Fig. 3, 3A, 3B)

Upon obtaining a flat overall response, each amplifier is then swept with the generator located in the truck and a tracing or sketch is made of the response. The tilt between the lower and upper channel limits of each strip is measured using an A-72 preceding the detector.

II

PERIODIC ROTATION AND INSPECTION OF AMPLIFIERS

201 General

Completion of the summation sweep with its concurrent balancing of levels should produce an improvement in overall picture quality.

To maintain these good quality pictures, it will be necessary to periodically inspect each amplifier thereby eliminating the possibility of having poor picture quality caused by the accumulation of amp response curve shifts with tube and component aging.

It has been the practice of many community operators in the past to permit the system to deteriorate until complaints are received (mostly from those subscribers located most distant from the antenna site). It is then necessary to completely overhaul the system, causing an unnecessarily long interruption of service while good reception is restored.

A periodic program of rotating, inspecting and realigning trunk line equipment will prove itself completely practical and economical in the increased reliability of service accompanied by good subscriber relations.

Evidence for focusing attention in the maintenance schedule on the trunk line is in the past experience of many operators. They have reported numerous service calls and poor quality pictures, which were rectified by aligning and balancing the trunk line. During this process, they did not find any one piece of equipment grossly at fault, but found several incorrect levels and slight response curve discrepancies. These added up to sync clipping, loss of definition, snow, sound modulation in the picture, buzz, etc. at the far corners of the system. This has been especially true in those systems having fifteen or more amplifiers cascaded. It is obvious, therefore, that most of the maintenance effort must be focused upon the trunk line response and levels.

202 Rotation Schedule (see Appendix A)

A rotation schedule is a plan for systematic replacement of each amplifier in the system with one that has been inspected and realigned in the shop. The amplifier removed from service goes to the shop and replaces another amplifier in turn. Experience has shown that a nine-week rotation schedule and a three-week balance schedule are optimum intervals for most systems. This involves three visits to each amplifier location in nine weeks, two of which are for balance check and one for rotation.

The rotation method is explained in detail in Appendix A.

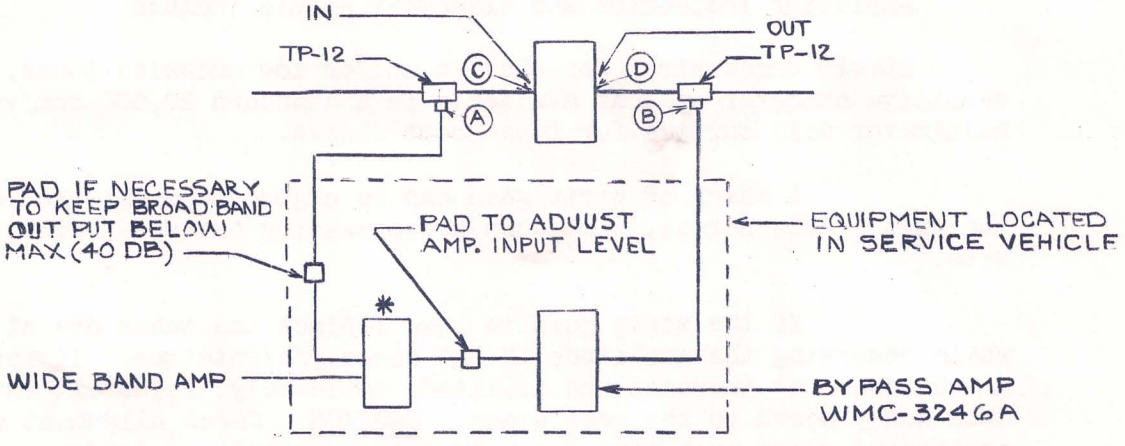
203 Spare Requirements

Each amplifier brought to the shop will be inspected, aligned and preheated, which should take approximately three days, before returning

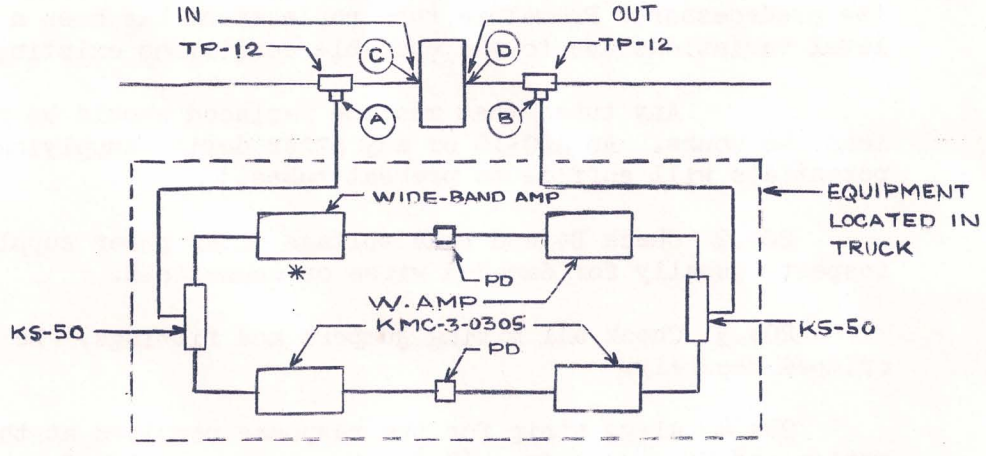
the output tube or low B+ applied to the output stage. The amplifier, after going through the preceding process, is "cooked" for 24 hours and alignment rechecked prior to installation in the system.

205 Replacement of Amplifiers in Service

The problem of rotating amplifiers with a minimum service disturbance or interruption is alleviated by using an amplifier as a "bypass" while the regular line amplifier is being changed. This procedure is illustrated in Figure 4 -- Bypass method replacement of amplifier in service.



W SYSTEM BYPASS AMPLIFIER



W+K SYSTEM BYPASS AMPLIFIER

(Figure 4)

* JERROLD PB-26 OR DSA-62

When test lines are removed, levels return to desired values. The above procedure results in no interruption in service. During operation from the TEST amplifiers trunk line signals are down 6 db. This ordinarily is not objectionable to the viewers. Making and breaking of test connections may result in momentary flashes on TV receivers.

III

ROUTINE BALANCE AND FIELD INSPECTION OF AMPLIFIERS

301 General

During the nine week rotation cycle, three balance checks will be made at each amplifier location, one of which involves replacement of the amplifier. The scheduling of balance checks is explained in Appendix A.

301.1 A balance check should include the following:

(a) Measurement (and readjustment, if necessary) of signal levels.

(b) A rough check of response provided by comparison of input and output sound to picture ratios.

(c) A spot check of composite video at first and last amplifiers visited during each day. This will disclose defects such as 60 or 120 cycle hum or sync compression.

302 Test Equipment

302.1 Model 704 or 704A modified to include video detector and test jack. (This modification should be made in the factory, and can be accomplished during periodic recalibration.)

302.2 Oscilloscope

302.3 Keying device.

303 Balancing an Amplifier

Connecting the test cable to the input test point, measure the input levels of sound and picture on all channels. Record on Maintenance Report form. Compare these readings with those normally obtained at that test point, which are recorded in Log Book. Differences of one or two db may be attributed to cable attenuation variations with temperature.

In the event that the input level is more than 4 db high or low, it will be necessary to check the levels at the preceding amplifier until the discrepancy is located.

If the input is within the 4 db tolerance, connect test cable to output test, measure the output sound and picture levels. Record in space provided on form. Adjust the gain controls to obtain proper operating levels. An amplifier requiring compensation exceeding 6 db may require investigation. Tap lightly on the top of the strip to check for intermittents, inspect VR's to see if they are conducting, measure line voltage, etc.

304 Measurement of Tilt

Upon obtaining proper output levels, compare the ratio of input sound and picture levels to that of the output levels.

IV

MAINTENANCE OF DISTRIBUTION EQUIPMENT

401 General

Since the broad band distribution equipment is not cascaded, the operating levels and frequency response are less critical; therefore, the periodic check will consist of checking levels as an indication of the frequency response and gain. Routine rotation will not be practiced.

The distribution equipment will be checked at the time of rotating the amplifier feeding the particular section. This establishes a nine-week maintenance schedule for distribution equipment.

Distribution equipment includes WADO's, associated TP's and feeder lines in "W" systems, and KTP's and KA-35's in "W+K" systems.

Checking of distribution equipment is usually accomplished with a 704. However, in case of smear, ghosts or severe attenuation of one carrier, a sweep generator is necessary.

A summation sweep of the distribution amps will not be required unless trouble is noted in a given area, in which case the distribution equipment and its associated TP-8's or KTP's may be swept by inserting the signal at the input of the amplifier feeding this equipment. The response is first observed at the output of the WADO then traced back towards the generator location until the discrepancy is located.

402 Use of the 704 to check KA-35's (see Technical Bulletin #3006 for techniques). Measurement of picture levels input and output:

Example:

KA-35	Input	Output
Ch. 05	- 16 dbj	Ch. 5 - 40 dbj
Ch. 03	- 16 dbj	Ch. 3 - 40 dbj
Ch. 2	- 16 dbj	Ch. 2 - 36 dbj
Ch. 4	- 16 dbj	Ch. 4 - 38 dbj
Ch. 6	- 16 dbj	Ch. 6 - 40 dbj

The example above indicated that the "K" side of the KA-35 is reasonably flat while the "W" side is tilted 4 db and is in need of alignment. This KA-35 should be replaced with another and taken to the shop for alignment.

403 Use of the 704 to check WADO's

V

ANTENNA SITE MAINTENANCE

501 General

An antenna site balance and inspection will be performed every three weeks at the time of balancing amplifier #1 (antenna site AGC amplifier). This check includes measurement of input and output test point levels (picture and sound) at each unit. These values are compared with a permanent record kept in the antenna site log book. (See form C-4 in Appendix C). These measurements indicate roughly the gain and response of each unit. Any discrepancies should be corrected by replacing units not meeting specifications or performing on-the-spot repairs.

502 Log Book (See Appendix C)

The pages devoted to the antenna site equipment will be completed during the initial alignment and balance function. This will include antenna signal data, input and output levels of each unit, frequency of trap settings, gains of units, etc.

NOTE: All equipment preceding the first AGC amplifier will be subject to changing levels due to fluctuating air signals. Therefore, minimum and maximum levels should be recorded.

503 Summation Response of Head-end Equipment

Routine rotation will not be practiced at the antenna site, but the alignment of the system head-end will be performed on the spot every nine weeks.

At this time, a sweep signal is fed into the first preamplifier and the response is observed at the output of the final reamplifer. If the response proves to be correct, proceed to the next channel; otherwise, observe the output of the preceding piece of equipment until the defective equipment has been located. Align same, and proceed in the same manner with the next channel.

The summary response of the antenna site equipment should be flat to the output of the final reamplifier.

504 Checking Interference Traps

The frequency and rejection of all traps should be observed during the summation sweep.

In many cases the interfering signal will be adjacent channel sound, and difficulty will be encountered in tuning the trap properly, due to the desired channel contributing somewhat to the 704 indication.

To check the frequency of the traps, a CW signal is fed into the trap while the output level is measured with the 704A. Tune the trap

APPENDIX A

ROTATION METHOD FOR SCHEDULING SYSTEM PLANNED MAINTENANCE

The preventive maintenance schedule calls for rotation of amplifiers for shop check and realignment once in a nine-week period, and a balance check at the pole site every three weeks.

Since there is no necessity for balance check at the time of replacement, the system breaks down, for an individual amplifier, to three visits in nine weeks, two of which are for balance check and one for rotation.

A number of factors bear on the apportionment of scheduled rotation (referred to as S.R. in succeeding instructions) and balance checks (B.C.). One of these factors is the necessity of not overloading the shop facilities; a second, the proper utilization of spares; and a third, the elimination of unnecessary mileage on service vehicles with its accompanying loss of man-hours.

The first factor requires that S.R.'s be spaced over the entire nine-week period, since this gives equal shop time to all amplifiers brought in. The same procedure allows the use of a minimum number of spares, taking care of the second factor, while the third presupposes that work along the trunks be scheduled to call for visits to successive amplifiers.

The scheduling breaks down to a consideration of the working days against the number of amplifiers in the trunk. Since Saturdays and Sundays are not counted, it can be considered that the entire system must be balance checked during a 15-day period (i.e., three weeks), while during the same period and in the same visits, one-third of the system must be rotated for S.R. Obviously the second 15-day period must see the schedule repeated, but with a different one-third undergoing S.R., and the third period sees another entire check with the final one-third getting S.R. The cycle is now complete and recurs in the following 45 work-days (nine weeks).

Examining the basic schedule, we see that the key intervals are three and nine weeks. We see that every amplifier site is visited once in a three-week period, or 15 days. Therefore, we may determine the number of daily visits to be made by dividing the number of amplifiers by 15. However, this poses a difficulty, since our visits must be distributed between S.R.'s and B.C.'s on the ratio of 1 to 2. This forces us to arrive at a figure for the daily visits which is 3 or an even multiple of three. In the event of a small system which cannot reach three daily for the 15-day period, less days per week are used, maintaining the three per day figure. In a large system, six visits per day, or perhaps 9, may be required, utilizing all or almost all of the 15-day period.

The system appears to get complex, but a simple method has been worked out which allows the proper schedule to be arrived at in a few moments. A simple chart, no larger than an ordinary sheet of ruled paper, can be constructed with a few lines drawn by an ordinary straight

PLANNED MAINTENANCE SCHEDULING FOR SYSTEM OF 77 AMPLIFIERS

Day No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Period I	Period II	Period III
Amplifier Number	1	7	13	19	25	31	37	43	49	55	61	67	73			S.R.	B.C.	B.C.
	2	8	14	20	26	32	38	44	50	56	62	68	74					
	3	9	15	21	27	33	39	45	51	57	63	69	75			B.C.	S.R.	B.C.
	4	10	16	22	28	34	40	46	52	58	64	70	76					
	5	11	17	23	29	35	41	47	53	59	65	71	77			B.C.	B.C.	S.R.
	6	12	18	24	30	36	42	48	54	60	66	72						

PLANNED MAINTENANCE SCHEDULING FOR SYSTEM OF 23 AMPLIFIERS

Day No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Period I	Period II	Period III
Amplifier Number	1		4		7	10		13		16	19		22			S.R.	B.C.	B.C.
	2		5		8	11		14		17	20		23			B.C.	S.R.	B.C.
	3		6		9	12		15		18	21					B.C.	B.C.	S.R.

(Figure 8)
Method of Establishing Preventive Maintenance Schedule

Upon designating a code number for each equipment location, the numbers are recorded on the log sheets devoted to that location, the maintenance scheduling and progress chart, the maintenance file folder, the master map, the schematic layout and will be used on the maintenance record sheets.

If more than one function is performed to a given amplifier and/or its associated distribution equipment, the indication on the chart will be a block containing more than one color (i.e. while executing a scheduled amplifier rotation and checking its associated distribution equipment, the technician located a defective distribution amplifier).

Half of the block devoted to the amplifier involved will be coded green for the rotation and half orange indicating distribution equipment repair.

The color code will be:

Green cross	-	scheduled amplifier rotation
Yellow cross	-	scheduled balance check
Solid Green block	-	scheduled rotation performed
Solid Yellow block	-	scheduled balance check performed
Red	-	unscheduled amplifier replacement
Blue	-	emergency amplifier repair
Orange	-	distribution equipment repairs

Upon completion of the maintenance cycle, a new chart will be set up. The completed one will be disassembled and filed.

C-3 Maintenance Reports

A comprehensive maintenance program demands the keeping of equipment repair and adjustment records to permit complete evaluation of recurring problems and provide information for maintenance cost analysis.

A composite report form has been prepared to accommodate both trunk amplifiers and distribution equipment for scheduled and emergency service.

The top portion of the form is prepared by office personnel from information derived from the scheduling chart in the case of scheduled maintenance and by the field service man when emergency service is performed. The second portion, "shop preparation", is to be completed by the technician in the shop after preparing an amplifier for a given location. Data required to align this amplifier is obtained from a copy of the permanent data log kept in the shop. The third portion of the form, field action, is filled in by the field technician while performing the service. The equipment site check list is completed only during scheduled rotation or if a defect was located while performing other service.

The amplifier being replaced (either scheduled or emergency) is brought to the shop with the form and the shop technician completes the section devoted to shop inspection, recording the response curve found, frequency and amplitude of tilts or dips found and repairs required. The reverse side of the report form concerns the distribution equipment.

There is space provided to accommodate all distribution locations fed from any given amplifier. The check list provided is to be completed on every scheduled visit. Any defective distribution equipment will be returned with the form to the shop, and the shop inspection portion filled out upon completion of repairs.

The form then goes to the Chief Technician for his inspection and finally to the office personnel to record the service performed on the scheduling progress chart and to file the form in the appropriate folder.

APPENDIX D

SERVICE VEHICLE

Recommended number and type service vehicle for given community size. Features to be considered in selecting service vehicle.

(a) Sufficient space to permit installation of a work bench and mounting facilities for test equipment.

(b) Completely enclosed to protect all equipment from inclement weather and permit heating for the comfort of the technician.

(c) Maneuverability and body dimensions permitting parking in normal size spaces.

(d) Body height should be such that a ladder may be easily carried on roof.

(e) Adequate traction and power to traverse antenna site road in all types of weather.

The above requirements can be obtained in one or two mass produced body styles - the three-quarter ton panel and the walk-in delivery.

The walk-in has the advantage of interior spaciousness, but at the sacrifice of maneuverability and ease of mounting a ladder.

The three-quarter ton panel meets most of the above requirements and is the commercially available body style best suited to our needs. (Do not confuse the panel with the suburban delivery variety.)

The vehicle should be equipped with a ladder rack, large red warning light on left rear and yellow on left front, a work bench, storage cabinets and drawers for tools and spare equipment, 110 V. lighting fixtures, and 6 V. dome light.

A new vehicle should be obtained for service since obviously dependability is mandatory.

The number of service vehicles needed will be dependent chiefly upon the number of trunk line amplifiers proposed for the system. Systems using up to 10 amplifiers may use one vehicle for maintenance and taps. Systems employing 10 to 30 amplifiers will need one vehicle to fill the service needs.

A 30 to 50 amplifier system will require one vehicle devoted exclusively to maintenance with a tap vehicle filling in in case of emergency. Systems using from 51 to 80 amplifiers will require two service vehicles. Those exceeding 80 amplifiers will use two service vehicles plus a station wagon which can also be used for service calls and general transportation needs.

APPENDIX E

SHOP EQUIPMENT, TOOLS, SPARE PARTS LIST, TECHNICAL FORCE

SHOP EQUIPMENT

1 -- VTVM
1 -- Tube short checker (or emission type tube checker)
1 -- Sweep alignment generator (7008 Philco or equivalent)
1 -- Detector (Jerrold D-84)
1 -- Variable RF attenuator (Jerrold A-72)
1 -- LHS 76
1 -- PB-26 or De-Snover
2 -- PD-6

TOOLS

1 -- Diagonal cutter 4" slim nose
1 -- 6" long nose needle point pliers
1 -- Set nut drivers (Spintite)
2 -- Alignment tools (metal type)
1 -- 6" crescent wrench
1 -- Slip joint combination pliers
1 -- #1 point Phillips head screw driver
1 -- #2 point Phillips head screw driver
1 -- PL-52
1 -- 6" x 3/16" screwdriver
1 -- 8" x 1/4" screwdriver
1 -- 6" x 1/8" screw holding screwdriver
1 -- Plastic alignment tool
1 -- center punch
1 -- tube puller
1 -- soldering gun (Weller 250 W)
1 -- soldering iron (Pencil type with very small tip)
1 -- lb. roll 60/40 thin solder
1 -- Hack saw with blades
1 -- Vise

SPARE PARTS LIST

1 -- Box ea. 1/16, 1/10, 1/8, 1/4, 3/4, 1, 2, 10 amp fuses
24 - 5654 tubes
6 -- 6BQ7 or 6BZ7 tubes
12 - 6CB6 tubes
6 -- 5V4G rectifier tubes
6 -- VR150/0D3 Voltage regulating tubes
2 -- Ea. Selenium rectifiers 65 ma., 75 ma., 100 ma., 150 ma., and 200 ma.
2 -- Ea. Electrolytic capacitors 20/40 300 WVDC
2 -- Ea. Electrolytic capacitors 20/40 150 WVDC
2 -- Ea. Electrolytic capacitors 20/20 150 WVDC
2 -- Ea. Electrolytic capacitors 50 mfd. at 50 WVDC
6 -- 1000 ohm 10 W resistors
12 - 1000 mmfd. capacitors
12 - 300 mmfd. capacitors

FORM C-4

DATE _____ ANTENNA SITE DATA CHANNEL _____

ANTENNA SIGNAL			
	PIX	SND	REMARKS
MIN			
MAX			
AVERAGE			
VSWR			

	PREAMP #1		PREAMP 2		CONVERTER		BPF		
AVERAGE	PIX	SND	PIX	SND	PIX	SND			
IN									
INPUT TEST									
OUT									
OUT TEST									
GAIN									

ASC

INPUT _____ OUTPUT _____ GAIN _____ TRAP REJECTION _____

SCO

OUTPUT _____ BIAS _____ SIGNAL INTO AGCU TO OBTAIN BIAS _____

FINAL AMPLIFIER INPUT: PIX _____ SND _____

DIAGRAM SHOWING ALL ANTENNA SITE EQUIPMENT PERTAINING TO THIS CHANNEL INCLUDING PD'S, TP'S, CABLES, TRAPS (INDICATE FREQ. AND REJECTION) ETC.

FORM C-6 AMPLIFIER PERMANENT DATA RECORD

LOCATION _____ SITE CODE _____

TYPE _____ POLE Nº _____

CHANNEL	INPUT		INPUT TEST		OUTPUT		OUTPUT TEST		PRECEDING AMP OUT		INPUT TRUNK ATTN
	PIX	SND	PIX	SND	PIX	SND	PIX	SND	PIX	SND	
05											
03											
2											
4											
6											

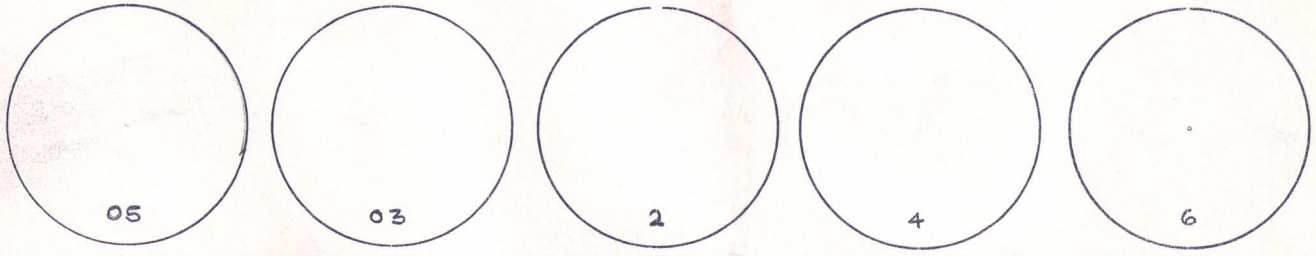
APPROX. TEMPERATURE _____ INPUT TRUNK CABLE LENGTH _____

CABLE TYPE _____

SPECIAL CONDITIONS: (PD'S IN INPUT ETC) _____

ALIGN THRU _____ FT OF RG $^{59}/_{U}$ TO OBTAIN TILT INDICATED BELOW

CURVES REQUIRED TO COMPENSATE FOR CABLE TILT (INDICATE AMPLITUDE OF TILT)



SCHEMATIC LAYOUT SHOWING ALL EQUIPMENT INCLUDING KTP'S, TP'S, PD'S AND INDICATE CABLE LENGTHS, PAD VALUES, LOCATION CODES, FED BY THIS AMP, ALSO INDICATE SITE CODE Nº OF PREVIOUS AMP

DISTRIBUTION EQUIPMENT

LOCATION CODE	CONVERTER AMP						WADO												BROADBAND					
		05	03	2	4	6		2	3	4	5	6		2	3	4	5	6						
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					
	IN						IN						OUT 2						IN					
	OUT						OUT 1						OUT 3						OUT					

CHECK LIST	OK	NG	LOCATION CODE AND ACTION TAKEN
C-52S			
C81S			
5911AS			
JUNPERS			
CABINET			
ARRESTOR			
MOISTURE			

OTHER DEFECTS ____________________

REMARKS ____________________

SHOP INSPECTION

REPAIRS REQUIRED ____________________

CURVE FOUND

DATE ____________________ TECH. SIGNATURE ____________________