

U.S. Patent 2,761,022

operating
instructions
for
MASTERLINE
CHANNEL
STRIPS
model MCSc
vhf single
channel
amplifiers

MCS Masterline Channel Strips are single channel amplifiers. Wherever the need exists for greater signal strength and/or to provide uniform output from one or more TV channels, MCS's are recommended. They are ideal for Master TV Systems, as well as for any TV antenna installation. The unit has high gain, high rejection of adjacent channels, AGC, and its own built-in power supply. MCS amplifiers are extremely versatile—they may be cascaded for one channel, or used for separate channels and their outputs mixed. Outputs are self mixing. Recommended for Color and B & W TV reception of any VHF channel.

FEATURES:

- Manual and Automatic Gain Control—Compensates for signal and line voltage variations.
- High Gain
- High Selectivity
- Input and Output Monitor Jacks
- Low Noise Input Circuits
- Matched Impedance Input & Outputs
- UHF Coaxial Connectors
- Maximum Flexibility—6 methods of operation depending upon input levels available and desired AGC control range (stiffness)

SPECIFICATIONS:

Gain:	Channels 2 thru 6.....more than 45db (175X) Channels 7 thru 13.....more than 35 db (56X)
Output:	Channels 2 thru 6.....1.4 volts maximum Channels 7 thru 13.....1.0 volts maximum
Input:	Minimum required to activate AGC at factory setting.* Channels 2 thru 6.....3.9 millivolts Channels 7 thru 13.....12.5 millivolts
Gain Controls:	Manual: 18db Automatic 20db
Monitor Jacks:	On both input and output; 20 db below input and output level.
Input & Output Impedance:	75 ohms
Frequency Response:	6 mc bandwidth, $\pm \frac{1}{2}$ db, for each single TV channel amplifier.
Tube Complement:	6DJ8/ECC88, 6CB6, 6EW6, 6AM8
Power Requirements:	105-129 volts, 60 Hz, 0.28 amps.
Fuse:	½ amp, slow-blow
Dimension:	13-13/16" long x 2½" wide x 4-3/8" high.
Mounting:	4—#6 or #8 screws.
Shipping Weight:	5.0 lbs.

*AGC level control set at factory for 0.7 volts output, but may be easily adjusted in the field, for any desired output between 0.45 and maximum output.

NOTE: All signal voltages are RMS—sum of picture and sound carriers.

BLONDER-TONGUE
Laboratories, Inc.
Newark 2, N. J.

OPERATING INSTRUCTIONS

1. For input signal levels below the values shown in specifications, leave the AGC level control at the factory setting (hole in shaft next to metal tag under mounting nut) and control gain with the manual gain control.
2. To achieve AGC operation when signal level is too low, another MCSc amplifier may be used as a pre-amplifier to raise the signal above the minimum level indicated in specifications.
3. With input signal levels above those shown in specifications, AGC operates when AGC level control is set at factory marks. Set the manual gain control in the maximum (clockwise) position.
4. If input signal exceeds about 10X the amount of signal shown in specifications, windshield wiper, herringbone or picture distortion may occur, indicating overload. If this happens, install a Blonder-Tongue Model MAT attenuator, or attenuator pad, at the MCSc input, or reduce the gain of previous amplifiers.
5. Check AGC action (bias voltage) at test jack. With AGC Level Control at factory setting, a constant output level of 700,000 microvolts ($\pm 1\frac{1}{4}$ db) can be maintained with specified input signal level.

Measure this voltage at the top chassis connector (marked AGC point) with a standard (20,000 ohms-per-volt) voltmeter. AGC voltage should be between 0 and -3V.
6. Test jack voltage should never go beyond -3.5 volts. This would indicate an input signal more than 10X (20db) the minimum required input in specifications. Input signal must then be reduced (see 4.). A reading of +0.4 V indicates that the signal is less than the required amount in specifications and should be pre-amplified if AGC action is desired.
7. **CABLE CONNECTIONS:** The model MCSc is equipped with UHF coax-connectors for input and outputs and with B-T solderless coax-connectors for the monitor jacks. The solderless jacks will take RG-59/U cable; refer to enclosed instructions. To connect a 300 ohm balanced antenna to the 75 ohm MCSc input, use a Blonder-Tongue Model MB Balun. When cascading two MCSc's for the same channel, connect one OUTPUT of the first unit to the INPUT of the second unit. Use a MTP-75, Terminating Plug, at the unused OUTPUT of the first MCSc. To mix outputs of MCSc on different VHF channels, use a coax jumper cable from an output of one MCSc to an output of the next unit. The MTP-75 plug is removed when both outputs on an MCSc are used. Any number of channels may be mixed in this manner. Either one or two multi-channel outputs may be taken from the MCSc system. If a single output is used, terminate the other with a MTP-75 Terminating Plug. The two unmarked solderless connectors on MCSc 7 thru 13 strips are factory test points for alignment purposes only. Do not make any connections to these points. The top chassis AC receptacle on each MCSc accommodates the power plug of the next unit when amplifiers are cascaded or mixed.
8. **BANDPASS TILT CONTROL** is located near the output connectors. This is a recessed control which can be adjusted by using a hex-end plastic tuning wand $1/10$ " between flats. This adjustment should only be made when equipment is being checked with a sweep generator and oscilloscope.

METHODS OF OPERATION

There are six methods of operation of MCSc Amplifiers. The one selected depends on the input levels available and the AGC stiffness desired. They are:

Method	Signal input range μV		Operating signal variation μV		AGC range for ± 1 1/4 db change in output
	Low Band	High Band	Low Band	High Band	
1 one MCSc non AGC	10-50,000	20-180,000	10-50,000	20-180,000	none
2 one MCSc AGC	5,000-50,000	18,000-180,000	5,000-50,000	17,500-175,000	20 db
3 two MCSc one AGC	25-5,000*	300-18,000	Signal variation of 10/1 within input range.		20 db
4 two MCSc both AGC	25-2,500	300-30,000	25-2,500	300-30,000	40 db
5 two MCSc both AGC with external attenuation	25-50,000	300-180,000	Signal variation of 100/1 within input range.		40 db
6 two MCSc both AGC with preamp		20-30,000	Signal variation of 100/1 within input range.		40 db

* depends on external attenuator (see method 3).

With methods 2 thru 6, outputs varying from 0.35 v to 1.0 volt are possible with input values from 50% below, to 40% above the input ranges shown above. The AGC level control can be set to other than the factory calibration mark to provide any output level between 0.35 v and 1.4 v. (See Fig. 2.)

METHOD 1. (See Fig. 1.) Always leave AGC level control at fully clockwise position. For full gain, rotate gain control fully clockwise. At full gain, input levels for undistorted output can be up to 5,000 μv low band and up to 18,000 μv in high band. Gain control may be used to reduce gain by up to 20 db (10X) and permit proportional increases in input. At 20 db gain reduction, permissible low band input is 50,000 μv. Corresponding high band figure is 180,000 μv.

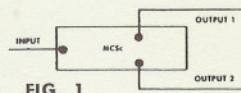


FIG. 1

METHOD 2. (See Fig. 1.) Always leave GAIN control set fully clockwise. Set AGC LEVEL control so that hole in shaft is next to metal tag under mounting nut. (See Fig. 2.) Input may vary between 5,000 and 50,000 μv in the low band and between 18,000 and 180,000 μv in the high band. Output will be regulated $0.7v \pm 1\frac{1}{4}$ db. (See Note 2.)

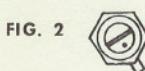


FIG. 2

METHOD 3. (See Fig. 3.) MCSc #1 acts as a high gain, low noise, non-AGC controlled preamp as in Method 1. MCSc #2 is operated as in Method 2. Adjust gain control of MCSc #1 so that test point voltage of MCSc #2 is correct. (See Note 2.) If the gain control range of MCSc #1 is insufficient, insert an attenuator, such as our Model MAT in output A.

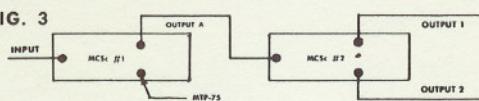


FIG. 3

METHOD 4. (See Fig. 4.) Always leave GAIN controls of both MCS's set fully clockwise. Set AGC LEVEL Control of MCS #2 at factory mark as shown in Fig. 2. Set AGC level control of MCS #1 fully clockwise. Connect jumper between the two AGC points as shown. Output will be held $\pm 1\frac{1}{4}$ db at about 0.7 v for inputs varying from about 25-2,500 μ v in the low band and 300-30,000 μ v in the high band.

METHOD 5. (See Fig. 4.) This method is used when the input may rise above the values given in Method 4. (AGC POINT voltage more negative than -3.5v.) Insert an attenuator in the output A line, of value equal to the ratio of maximum input to 2,500 μ v for the low band, or to 30,000 μ v in the high band. If the value of the input signal is not known, increase the attenuation at A until the AGC point voltage is less negative than -3.5v. If more than 26 db is needed in the low band, or 15 db in the high band, reduce the input to MCS #1 by an additional attenuator. (See Note 2.)

METHOD 6. For inputs below 300 μ v on the high band, add a low noise preamp such as another MCS or a Model CB ahead of MCS #1 in the set up of Method 4. (See Note 2.)

CAUTION: In Method 1, adjust gain with GAIN Control. Always leave AGC LEVEL control rotated by fully clockwise.

In Methods 2, 3, 4, 5, 6, always set AGC level control of MCS in Fig. 1 and MCS #2 in Fig. 3 and 4, at factory mark or somewhat counter-clockwise. Always leave AGC LEVEL Control of MCS #1 in Fig. 4 rotated fully clockwise.

NOTE 1. When 300 ohm transmission line is used to the MCS amplifier input, a B-T Model MB Matching Transformer, should be installed as far as possible from the amplifier input to provide 75 ohm cable (RG-11/U or RG-59/U) to the amplifier. Model MB Matching Transformer should be used 100 ft. after the 75 ohm output to feed 300 ohm (or open) line, to avoid oscillation. Input and output lines must always be kept apart.

NOTE 2. (a) Check "AGC POINT" voltage with a 20,000 ohms per volt meter. The reading should be between +0.4 and -3.5 volts.

(b) In Methods 2, 3, 4, 5, 6, if "AGC POINT" voltage is about +0.4 v, AGC action is not occurring. If this voltage is zero volts, the input signal is so low that the AGC is just starting to operate. If the input signal fades appreciably, the AGC cannot hold.

(c) In Methods 2, 3, 4, 5, 6, if the "AGC POINT" voltage is about -3.5 v, the input is near the maximum level which can be handled. If it should increase, cross-modulation may occur.

(d) The "AGC POINT" voltage indicates the gain reduction in the amplifier caused by AGC action (to keep the output level constant when the input signal increases).

Never reduce the "AGC POINT" voltage by adjustment of the AGC level Control. Either the AGC Level Control is incorrectly set or the input signal level is too high.

NOTE 3. If input levels of half those given in Methods 2, 3, 4, 5, 6 are desired, rotate AGC LEVEL CONTROL somewhat counter-clockwise to reduce output from 0.7 v to 0.35 v. AGC action at somewhat reduced stiffness will result.

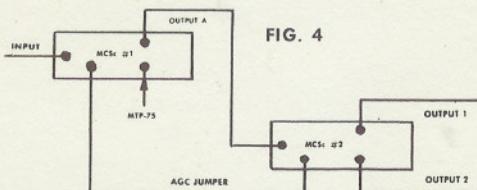


FIG. 4

NEWARK, NEW JERSEY 07102

9 ALLING STREET

BLONDER-TONGUE LABORATORIES, INC.



(TEAR HERE)

THIS IS YOUR WARRANTY

Please Retain This Part of the
Card for Your Records

engineered and manufactured by

BLONDER TONGUE



9 Aliling St., Newark, 2 N.J.

Comment on "No" answers:

1. Was this item securely packaged as received? Yes No
2. Are the instructions clear? Yes No
3. Does this item perform to your expectations? Yes No
4. Does the appearance meet your standards? Yes No

YOUR ADDRESS Street City State

YOUR NAME

Date of Purchase Dealer's Name

Model# Serial#

(Card must be returned within 10 days of purchase date or warranty is void)

FILE THIS CARD OUT AND MAIL IMMEDIATELY

Warranty

Each Blonder-Tongue Product is produced under rigid quality control standards. This unit is fully warranted to be free from defects in workmanship and components for a period of 120 days from date of purchase. If service is required during this warranty period please pack the unit carefully and send it prepaid to:

BLONDER-TONGUE SERVICE DEPT.
9 ALLING ST., NEWARK, N. J. 07102

Enclose a packing slip indicating:

1. Your name and address
2. Model and serial number of equipment
3. Description of defect

This unit will be repaired and returned to you prepaid.

This warranty does not apply to defects caused by mishandling or misuse of equipment.